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COTTON

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RELATION OF WATER POWER TO THE TEXTILE INDUSTRY.

One of the most important controlling factors in the development and progress of the manufacturing enterprises of the South is the water powers that originate in the Appalachian mountains and which are protected by the natural growths of the forests in maintaining a uniform flow of the streams as they descend the hillsides and through the valleys of the Piedmont plateau.

No section of the country is more blessed with natural advantages for building up great manufacturing industries than is found in this Southern section of our country, which has already taken upon itself momentous steps beyond the fondest aspirations or anticipations that may have been entertained even so late as within the last quarter of a century. It is for this reason that it becomes incumbent upon all those who believe in a grand industrial progress of the South to use every effort in maintaining the vantage ground that she possesses, but which she is likely to lose at a vital point unless immediate attention is given to it, and unless the people are aroused to the danger that confronts the great manufacturing advantages that the world is now looking upon with admiration and expectancy. The loss with which the South is now confronted, lies i nthe denudation of its mountains and hills of their forests that serve to preserve the initial reservoirs of the streams that supply the water for turning the machinery of manufacturing establishments of all kinds that are contributory to a vast and diversified industry.

So important is this question of the preservation of the streams that have their source in the Appalachian range of mountains upon which the future success of Southern industry so largely depends, that it is now being considered in all of its aspects by the United States Government, State authorities and commercial organizations, upheld by a broad and liberal public sentiment. The United States Government through its bureau of geological survey has of recent years given much attention to the measuring of the streams that rise in the Appalachian range of mountains with special reference to the development of water power, as an industrial necessity in the manufacturing advancement of the South. The measurements have shown that these streams are capable of developing 2,700,000 horsepower, available for manufacturing purposes, based on the minimum flow of the water for the year, without reckoning in this efficacy of the streams those which cannot furnish 500 horsepower, and, furthermore, in all calculations only 90 per cent. of the observed power and 80 per cent. of the energy of the falling water is used. These calculations do not take into consideration the storage facilities of the streams, which are capable of being taken advantage of to the extent of increasing their effective power from three to thirty times, depending upon conditions governing the construction of reservoirs. It has been estimated by the geological survey that at least 50 per cent. of the indicated minimum horsepower is available for economic development for industrial purposes. On this percentage there is

at least 1,350,000 horsepower that can be profitably utilized in the Southern States in what is known as the Piedmont section, for every purpose requiring power to be consumed at the water fall or transmitted electrically to almost any distance.

If this naturally available horsepower exists, which possibly can be increased by the establishment of reservoirs as engineering skill may be able to effect though to the extent of only 20 per cent., there will be an efficient potentiality of 1,620,000 horsepower, capable of turning 50,000,000 cotton spindles, operating on the class of products now being made in the South, or 60,000,000 spindles operating on the class of products made in New England. It is not conceivable, however, of all this power being devoted to cotton manufacturing, as much of it would naturally be devoted to the use of municipalities for lighting and power, and to such industries as iron and steel works, rolling mills, foundries and machine shops, electric railways, flour and grist mills, planing mills, book and job printing and newspapers, and machine shops, as well as innumerable other industries. Conservatively speaking, cotton manufacturing enterprises cannot expect to secure more than one-fifth of this available power, or only enough to operate 10,000,000 spindles, or little more than twice the number now in operation.

It is right here where the cotton manufacturing industry cannot afford to view the situation with apathetic contentment that no concern of the immediate future need disturb the present equipose of conditions in any fear that there will not be a sufficiency of water power for all the cotton spindles that may be placed in operation for generations to come. Any such belief in the adequacy of the water power for future requirements of cotton mills is fraught with elements of dangerous consequence, and should be relegated at once as detrimental to the best interests of a manufacturing business that dominates today the industrial position and progress of the South. Immense as the available water power of the Piedmont region of the South Atlantic States may appear to be, depending so much for its development upon conservation of mountain forests as the source of its supply and maintenance, it is by no means inexhaustible, and the rapidity with which it is now being utilized will tax its capacity to the utmost, under the best engineering skill, within the life of the existing generation. We think the business men of this section of the South have not given this subject the attention that its importance demands, and while their present needs are being satisfied, too little thought is given to those of their successors.

The importance of the preservation of the forests and the maintenance of the streams are of too vital consequence to the industrial progress of the South to pass unheeded or with indifference by those interested in or dependent upon the building up of a vast manufacturing community. It may appear a singular fact that the South has not given the attention that it should to the utilization of its water powers for manufacturing purposes, as according to the United States census there was less power derived from the waterfalls in 1905 than in 1890, for while 150,000 horsepower was utilized in the latter period only 140,000 horsepower was made use of in the former period, steam power being chosen instead, due undoubtedly to the proximity and abundance of coal supplies, and the better facilities for road instead of locating them at the water falls, which might be a long distance from means of transportation at a time when transmission of power by electricity was scarcely thought of and but little known. But now that power can be transmitted by electricity from the water falls to the factories wherever they may be situated, the utility of the water power has become much more appreciated, and its development for this reason in this region has been one of the wonderful schemes of an industrial advancement in the South. The South, in 1905, gave but 10 per cent. of its normal water power, and only 8 per cent. of what it was capable of being made by engineering skill. The manufacturing interests of the South lie in the proper utilization of its water power in connection with its electrical transmission to places where manufacturing establishments are desired, located at points where transportation facilities can be had to advantage. Especially is this combination most valuable in those sections where coal is difficult of being obtained except at a high cost, which is likely to be enhanced as the supply becomes low, or the demand increased.

Every reservoir system that may be depended upon would be a failure unless the water sheds which feed it are supplied by the small streams that have their sources in the forests. The forests therefore is the principal factor in the water power system of the South for equalizing the flow of the streams.

COTTON EXCHANGES.

Cotton exchanges and their methods is a subject that has been freely ventilated for a number of years, and notwithstanding all opinions, pro and con, the agitation upon the influence of these institutions is as animated today as it was when first taken up and discussed in and out of Congress, respecting their usefulness to trade and commerce, especially in their relation to the agricultural interests of the country, as a means for regulating the movements and prices of crops and their disposition from the source of production to the place of consumption. That vicious elements of trade have crept in through many of the transactions that are admitted under the rules and regulations governing their proceedings, admits of no question, but this can readily be said of all business systems no matter how thoroughly they may be organized along lines of equity and consistency with the needs of trade. Still there are many who appear incapable of distinguishing between the good and the bad, and seem to have no realization of anything except what can be seen in the latter, without giving the former any virtue which may belong to it. This way of looking at things means to those thus disposed nothing but evil in the dealings of exchanges, as was noted in their vigorous denunciation by representatives of cotton growers that were present at the Cotton Conference in Atlanta last October. These arraignments were combated by the representatives of the spinning industry that were present, and while gambling opportunities were recognized as feasible under the rules of exchanges, it was clearly shown that they had no recognized standing as a part of the legitimate functions of these institutions.

Notwithstanding exchanges have established for themselves in this country and abroad a position as legitimate and useful instruments of trade for the regulation of traffic

in commodities, they stand out as targets for condemnation as much as ever before.

An example of the wrath against cotton exchanges is the bill that has been introduced into the House of Representatives, Washington, by Congressman A. S. Burleson, of Texas, which has among its provisions clauses making it unlawful for any person or association "to send or cause to be sent from one State to another, or to any foreign countries, or knowingly to receive or cause to be received, any message relating to a contract for future delivery of cotton, without intending that the cotton to be contracted for shall be actually delivered."

While this bill or anything of similar nature is not likely to be acted upon favorably, or otherwise, in fact, by Congress, it goes to show that there is existing in the minds of many, that dealings in commodities like cotton for future delivery is malicious, unless it is the intention of the seller or the buyer to deliver or take the actual commodity contracted for. While this appears prima facie as competent legislation against gambling proceedings it is more apparent than real, and is more chimerical than substantial.

Without discussing the merits or demerits of cotton exchanges and many of their methods, and the advantages which their rules often time give to the manipulations and schemes of gamblers, it is safe to say that they are too well fixed, as essential factors in the commercial transactions of the world, to be eliminated in their essential features as business instruments for carrying on trade in cotton or other agricultural products that are widely dealt in. While Mr. Burleson's bill is supposed to be introduced into Congress in the interest of the cotton growers of the South, it is evident that his efforts in this direction do not receive the endorsement of the National Ginners' Association, whose president (J. A. Taylor) has felt it incumbent upon himself officially to denounce this bill as detrimental to the best cotton interests of the South. He earnestly urges upon cotton ginners and planters of this section not to allow themselves to be carried away with the specious arguments or declarations in this species of legislation. President Taylor believes that anything of the nature as contained in this bill, should it become a law, would cost the Southern farmers millions of dollars before it could be repealed; and we believe that he is right in this respect, and it is gratifying to notice that a person of his official standing is willing to stand up before those he represents and very justly declare his convictions in favor of a system against which his followers have proclaimed themselves particularly opposed. But Mr. Taylor goes still further, and says that what is really needed is more speculation rather than less, especially in the South, "as it would be nearly all on the buying side, and help carry a load of cotton until the spinner needs it." Mr. Taylor in intent, truthfully says: "Without our exchanges we would have nothing to govern the price except Liverpool, and as it is always to their interest to buy cotton cheap, we would be at their mercy. If all our surplus sales have to hedge each day in Liverpool, that market would go down so fast that it would almost create a panic." His further statement is fraught with pregnant meaning: "If there are faults in the present methods of conducting the exchanges, regulate them by law if necessary. If we have a piece of machinery that does not work exactly right, we do not destroy it, but we overhaul it and oil it up well, and it usually runs much better."

The elimination of cotton exchanges would be disastrous to the manufacturing interests, as they have become potent means for constructing our future business upon which the manufacturing industry is obliged to depend according to existing conditions which have been built up in strict accordance with the needs of commerce. Therefore to both cotton manufacturers and planters, exchanges have become an absolute necessity.

THE ELEMENTS OF PROSPERITY ARE PREVALENT MORE THAN EVER.

The country has had other business depressions and recovered with a prosperity exceeding that of previous times, both in intensity and magnitude.

The elements of prosperity are present today in as great power as ever, and though they are apparently dormant they are not inactive, but gathering strength for greater vigor and efficiency than has ever been witnessed and experienced. There is no such thing as retrogression, as this would be inconsistent with all previous history, and with the potential forces that exist and which have been active for more than a century in making this country the grandest example of accumulated wealth and potency ever known in the story of nations and of people, exceeding the tales of romance or of reality.

We are now experiencing a period of readjustment, in establishing conditions to the new order of things that have been invoked by the enlightenment of mankind in the immense possibilities that confront it by the evolutions wrought through the agencies of rapid inventions and discoveries. We have passed through an era of a new existence,—one of initiation,—and are entering upon another,—one of development,—that will have greater cogency for good and power for emolument than the world, and our own country in particular, has ever been cognizant of.

The financial commotion which has brought our industry and trade to a standstill can be viewed in no other light than an interruption, a period of meditation and recuperation till we regain our breath, which we have been taxing too vigorously in running the race for greater achievements. We have not been living beyond our means, but beyond our capacity to adapt them to the needs which we have created. We have been too wasteful in the use of the things with which we have been so abundantly blessed; and their more economical employment toward productive ends has become incumbent upon us, to which we must now devote our energies and discriminating judgment.

During our period of exhiliration we have failed to take notice of many conditions of weakness in the finances of the world which were intensified by the urgent demands for more money to carry on schemes of various magnitude engaging the talent and activity of all nationalities. The call for money and credit has been tremendous.

Last year we lived beyond our capacity of absorption. We were unable to bring into a systematic form the gigantic schemes that had been set in motion. Notwithstanding the enormous production of gold, doubling in value within the last twelve years, it was not sufficient to counterbalance the wastes of war, conflagrations, earthquakes, speculations, and stupendous expenditures of nations and municipalities, besides meeting the unprecedented demands of trade at valuations far in excess of anything ever before known.

But there is no occasion to remain depressed, for we can rest satisfied that the injurious effects of the fright that has been experienced will be of short duration as compared with that brought about by the disturbances of either 1873 or 1893. The country is in a much better condition to enable it to recover its equilibrium than was the case at these periods. Its vitality, which has not been in the least effected, is as marvellously robust and nervous as ever. With a national wealth of $115,000,000,000, or $1,310.00 per capita, a foreign commerce of over $3,300,000,000, of which nearly 60 per cent. consists of exports, double what it was twelve years ago, and railroad facilities of transportation 20 per cent. more than they were ten years ago, and two-fifths of those of the whole world, the country is in possession of industrial sinews that have a stupendous striking force that cannot long remain inert, when taken in connection with the astonishing thrift of a people that has in savings institutions $3,600,000,000, more than equal to our aggregate commerce for one year. Considering all that these figures represent and infer, is it possible or imaginable for the business of this country to languish or to do anything else but bound into flourishing activity?

FIRST POWER LOOM WEAVING.

The following is an extract from a paper prepared by Nathan Appleton on the "Introduction of the Power Loom," and may be of historical interest to many of the readers of this journal. It is well to be familiar with this bit of history, as it is connected with one of the most important epochs in the progress of cotton manufacturing in the United States, and had its influence upon that of Great Britain. It was the beginning of power-loom weaving in this country, and though suggested by some of the devices employed in Great Britain, at the time, it was a new and radical departure worthy of the highest inventive ingenuity.

"At the time when the Waltham company first began to produce cloth (on the power loom) there was but one place in Boston at which domestic goods were sold. This was at a shop in Cornhill kept by Isaac Bowers, or rather by Mrs. Bowers. As there was at this time only one loom in operation, the quantity accumulating was not very great.

"However, Mr. Lowell said to me one day that there was one difficulty which he had not appreciated—the goods would not sell. We went together to see Mrs. Bowers. She said everybody praised the goods, and no objection was made to the price, but still they made no sales. I told Mr. Lowell the next time they sent a parcel of the goods to town to send them to the store of B. C. Ward & Co. and I would see what could be done.

"The article first made at Walthan was precisely the article of which a large portion of the manufacture of the country has continued to consist; a heavy sheeting of No. 14 yarn, 37 inches wide, 44 picks to the inch and weighing something less than three yards to the pound. That it was so well suited to the public demand was matter of accident. At that time it was supposed no quality of cotton could be sold without being bleached, and the idea was to imitate the yard-yide goods of India, with which the country was then largely supplied.

"Mr. Lowell informed me that he would be satisfied with 25 cents the yard for the goods, although the nominal price was higher. I soon found a purchaser in Mr. Forsaythe, an auctioneer, who sold them at auction at once at something over 30 cents. We continued to sell them at auction with little variation of the price. This circumstance led to B. C. Ward & Co. becoming permanently the selling agents."

THE BOLL WEEVIL IN OKLAHOMA.

W. M. Bamberge, special agent of the bureau of plant industry of the Department of Agriculture, who was recently assigned to eastern Oklahoma, has found the boll weevil so bad for a distance of fifty miles above the Red River that he predicts that the crop next year will not be more than one-third the average. He has visited several counties and finds things very threatening. A school house campaign has been organized and every effort will be made to instruct the planters how to make a crop despite the boll weevil. Inasmuch as one man cannot cope with the boll weevil proposition alone the Ardmore Commercial Club has taken the matter up with the Department of Agriculture and hopes to have at least five additional special agents assigned to the district. The club will also endeavor to secure two or more carloads of an early maturing variety of seed which will be distributed among the farmers at cost. This county has produced fully 35,000 bales of cotton this year and a marked falling off in the production will be materially felt.

The first machine specially made for the production of warp fabrics on a knitting system was brought out as far back as the year 1775 by a man named Crane. In reality this loom, as it was called, was simply an adaption of the ordinary stocking frame to the making of a fabric with warp or vertical threads alone. In appearance the hand warp loom is singularly like the hand stocking frame possessing an almost identical frame and woodwork but differing in possessing certain loop formers known as guides, and these, together with the bars which contain them and the mechanism which gives them movement replace the jack sinkers and in consequence the whole of the inside moving portion of the hand stocking frame.

The new child labor law which went into effect in New York, on January 1, makes illegal the employment of a minor under 16 years of age in any factory before 8 o'clock in the morning or after 5 o'clock in the evening, or for more than eight hours in any one day, and prohibits the employment of any minor under 18 or of any female, before 6 o'clock in the morning or after 9 o'clock in the evening, or for more than ten hours in any one day, except to make a shorter workday on the last day of the week.

The committee of the International Cotton Congress, Manchester, Eng., has unanimously approved the plan to purchase cotton plantations in the United States, to be controlled by an European company, as the speediest means of reaching the reforms advocated at all internatonal conferences.

The Sea Island cotton belt needs to diversify, to rotate crops, to use fertilizers more rationally, to build up the thin soil, to plow deeper and cultivate shallower, and to economize hand labor by modern farm machinery.

SEA ISLAND COTTON.

Seed Selection and Diversified Cropping System Advised.—Requirements of Soil, Moisture, Humidity.

W. A. ORTON.
Pathologist, Bureau of Plant Industry, U. S. Department of Agriculture.

Our country can feel a just pride in the Sea Island cotton industry, for it produces the longest, finest and most valuable cotton grown in the world. Its silky staple is used for spinning fine fabrics and laces, and is of paramount importance to the thread industry, which requires a considerable part of the crop. Where great strength and durability are essential, as, for instance, in United States mail bags and in pneumatic tires, Sea Island cotton is employed. The highly organized and laborious methods of culture, the excellent system of seed selection, and the painstaking care of the product which have maintained the high quality of the cotton grown on the Sea Islands are matters of special interest.

It is quality rather than quantity that gives economic importance to the Sea Island cotton industry. An improvement in quality, an increase in production, and a greater profit to the acre are all possibilities of the future. They will result from the general adoption of improved methods and the extension over the whole Sea Island cotton belt of the careful system of seed selection and handling now practiced in one portion of the area. On the other hand, conditions are such that the industry may in time be crushed by competition unless the farmers awake to the necessity of considering the needs of the consumer as regards quality and purity and learn that the cost of production per pound can be reduced by increasing the yield per acre and that a diversified cropping system is safer and more profitable than the all-cotton plan.

The successful cultivation of Sea Island cotton in this country is confined to the area lying southeast of a line drawn from Georgetown, S. C., to a point in western Florida. The accompanying map shows the approximate quantity produced in each county in this district, each dot standing for 500 bales or a fraction thereof.

In South Carolina the center of production is on the Sea Islands along the coast, where the finest staples are grown. The chief of these islands are James, Edisto, John, and Wadmalaw.

It is interesting to learn that in Georgia the coast counties produce scarcely any cotton, owing to the unfavorable character of the country, the absence of the necessary labor, and the predominance of the lumbering and trucking industries. The interior counties which grow Sea Island cotton extensively also produce considerable upland cotton.

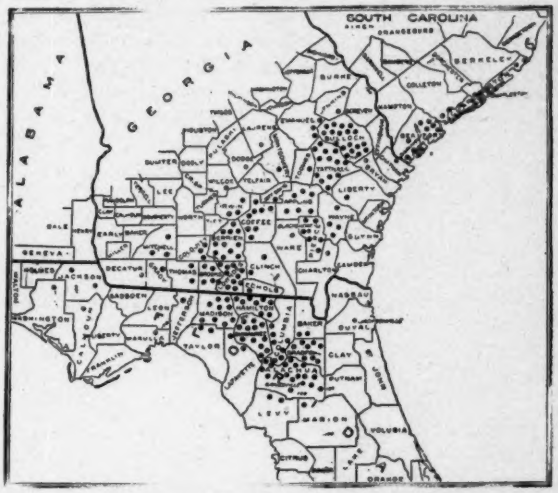
In Florida a similar condition exists. Cotton is not grown on the coast, but is confined to the interior counties in the north-central portion of the State. Here the proportion of upland to Sea Island cotton is much smaller, until one reaches the western counties, where conditions are less favorable for the long-staple cotton and where the upland type is mainly grown.

The annual crop fluctuates widely, according to the nature of the season, but the average yield in bales of not quite 400 pounds each during the past five years has been as follows: South Carolina, 10,957 bales; Georgia, 50,311 bales, and Florida, 33,749 bales.

Several factors must be considered when seeking a location for growing Sea Island cotton. Those mentioned here affect not only the yield but the quality of the staple, its color, and the percentage of lint to seed. The relative influence of the various factors is, however, not always determinable.

The crop requires a sandy or a sandy loam soil, preferably with a clay or compact sand subsoil about a foot below the surface. Most of the Sea Island cotton is grown on the soil type classified as Norfolk fine sand, with lesser areas of Norfolk sand, Norfolk sandy loam, and related types. On the Sea Islands where a clay subsoil is rarely found, the growers seek to maintain a compact layer beneath the plants by the tramping of stock during the year the land is resting. The interior growers prefer a clay subsoil, but sometimes plant cotton on quite deep sand, where the quality is satisfactory; the yield is smaller, however, in such cases.

A well-regulated water supply is the most important



MAP OF SEA ISLAND COTTON AREA OF THE UNITED STATES SHOWING DISTRIBUTION BY COUNTIES. EACH DOT STANDS FOR AN AVERAGE PRODUCTION OF 500 BALES.

factor influencing Sea Island cotton. Thorough drainage is essential. On this account more and better cotton is grown on the slightly elevated margins of the Sea Islands than in the lower central portions. Tile drains make possible the cultivation of land otherwise too wet. In the interior, cotton is grown only where there is suitable drainage. On the other hand a liberal and regular supply of water is needed, and wherever cotton is planted on the dry hills in the upper edge ofthe Sea Island cotton belt inferior results are secured, the staple becoming shorter and harsher. The lower lying lands are better, provided they have adequate drainage.

Soils very rich in humus appear to be unsuited to Sea Island cotton, producing too rank a growth; but a deficiency of humus is also a serious objection, as such land produces a small plant with a tendency to the shedding of bolls and to rust.

Atmospheric humidity appears to be a prominent factor in influencing the quality of the staple. On the Sea Islands, fields having an ocean exposure are said to produce

a finer and glossier staple on account of the moisture-laden ocean breezes, and in the interior one advantage of the lower lands is doubtless their moist air, which is conserved by protecting forests and near-by swamps. In the absence of sufficient moisture in the air the staple becomes harsh and shorter. This is further shown by the fact that a wet season is more favorable to Sea Island than to upland cotton, while the upland varieties do better in a dry season. The relative production of upland and Sea Island cotton in the northern counties fluctuates with the season and the changes in acreage due to varying market conditions.

The mixing of seed and the hybridization which result from planting cotton of both types in the same community is a serious handicap to the growers of Sea Island cotton. In this respect portions of Florida where only Sea Island cotton is grown possess a marked advantage, and the introduction of upland varieties should be discouraged.

Sections outside the present Sea Island cotton belt have from time to time attempted to engage in its culture, but such extensions of area are unnecessary and do not promise a profit. No other portion of our cotton belt is as well adapted to the crop as the area in which it is now grown. This is shown by the fact that during the past hundred years very many attempts have been made to grow Sea Island cotton in other States, and all have failed. Such extensions are unnecessary, because several times as much as the present crop could be produced in the area now devoted to Sea Island cotton, if circumstances required it. This increased production could be accomplished in part by clearing and planting new land, for neither on the Sea Islands nor in the interior counties is more than a fraction of the land under cultivation, and in part by increasing the yield per acre, which could be doubled by better cultural methods and the practice of seed selection. An additional increase would result from the substitution of Sea Island for upland cotton in the border counties where both are now grown.

Pickers accustomed to upland varieties object to the small and partly closed Sea Island bolls, and it is difficult to get the cotton picked even at the prices now paid—$1.00 to $1.25 a hundred pounds. The ginning must be done on a roller gin, as the saw gin injures the staple too much, and a specially equipped ginnery is therefore necessary.

(*To be Continued.*)

ENGLISH EXPORTS OF TEXTILE MACHINERY.

There was exported from England in 1907, textile machinery to the value of $40,000,000. Of this amount $2,700,000 was the export value to the United States, which would make the cost to the American manufacturer, duties paid, $3,900,000, enough to have equipped all of the cotton mills that were started in the South during 1907, had all of this machinery been for cotton mills.

ENGLISH COTTON MILL PROFITS.

According to English papers the cotton spinning industry there last year established a record. One hundred companies having a share capital of £3,722,780, have earned (after allowing for wear and tear of plant) no less than £1,321,157 net profit, or nearly 35½ per cent. This gives an average profit per company of £13,211, against £6,555 for 1906, or an increase of over 100 per cent. The dividends and bonuses declared show an improvement, the average being 15⅞, against 9 2-3 per cent. paid in 1906. The total capital employed includes £2,377,466 borrowed capital, either by way of mortgages, debentures, or open short-date loans. Calculating that this auxiliary capital has received 4 per cent., or, say, £96,000, the total profit earned on £6,100,246 would have amounted to £1,417,157, which works out to nearly 23¼ per cent. on the total capital employed. The returns which show these excellent profits are not derived from the best or up-to-date companies possessing the newest plants, but include mills that have been in existence for over 30 years.

A REFLECTION OF THE ATLANTA COTTON CONFERENCE.

A meeting of the committee of the International Cotton Congress was held in Manchester, England, last month, C. W. Macara in the chair.

The Chairman and Mr. Arthur Kuffler reported upon their journey of four thousand six hundred miles through the cotton-growing States of Americe, and promised that the voluminous report on their experiences should be ready before the holding of the next International Congress in Paris.

A proposal to establish a permanent organization, including cotton growers, spinners, and manufacturers, was referred to the Paris Congress, at which large numbers of American delegates are expected to be present.

IMMIGRANTS IN GEORGIA.

Last shipment of immigrants to Georgia is said to be the most satisfactory in the history of the State Immigration Association. All the men are strong, sturdy laborers, who seem to have come to this country to work and have all settled down with a determination to make Georgia their home. Those who got employment at Eagle and Phenix Mills are much pleased with their place and surroundings. These men are in constant communication with other members of their party, now in various cotton mill centers of the State, and report all are delighted with Georgia and that many have written to Europe for their families and friends to come to this State. It is believed by President Jordan, of the State Immigration Association, that immigrants here can do more toward bringing in additional European laborers by writing home true conditions in the South than any inducement that could be offered by association.

VALUE OF DEVELOPED WATER POWER.

The value of a developed water-power is stated by Chas. T. Main, mill engineer and architect, of Boston, to be as follows: "If the power can be run cheaper than steam, the value is that of the power, plus the cost of plant, less depreciation. If it cannot be run as cheaply as steam, considering its cost, etc., the value of the power itself is nothing, but the value of the plant is such a sum as could be paid for it new, which would bring the total cost of running down to the cost of steam power, less depreciation. That is, it is worth just what can be gotten out of the plant and no more."

Whoever tries to sow discord between the capitalist and the laborer is an enemy of the social order.

White Oak and Proximity Cotton Mills, Greensboro, N C.

The acompanying illustration shows a view of three cotton mills, located north of Greensboro, N. C.,—White Oak, Revolution and Proximity Mills,—of which Cæsar Cone is President, Julius W. Cone, Vice-President, and Bernard M. Cone, Secretary and Treasurer. The White Oak Mills are seen in the foreground, the Revolution Mills just beyond, the Proximity Mills in the distance.

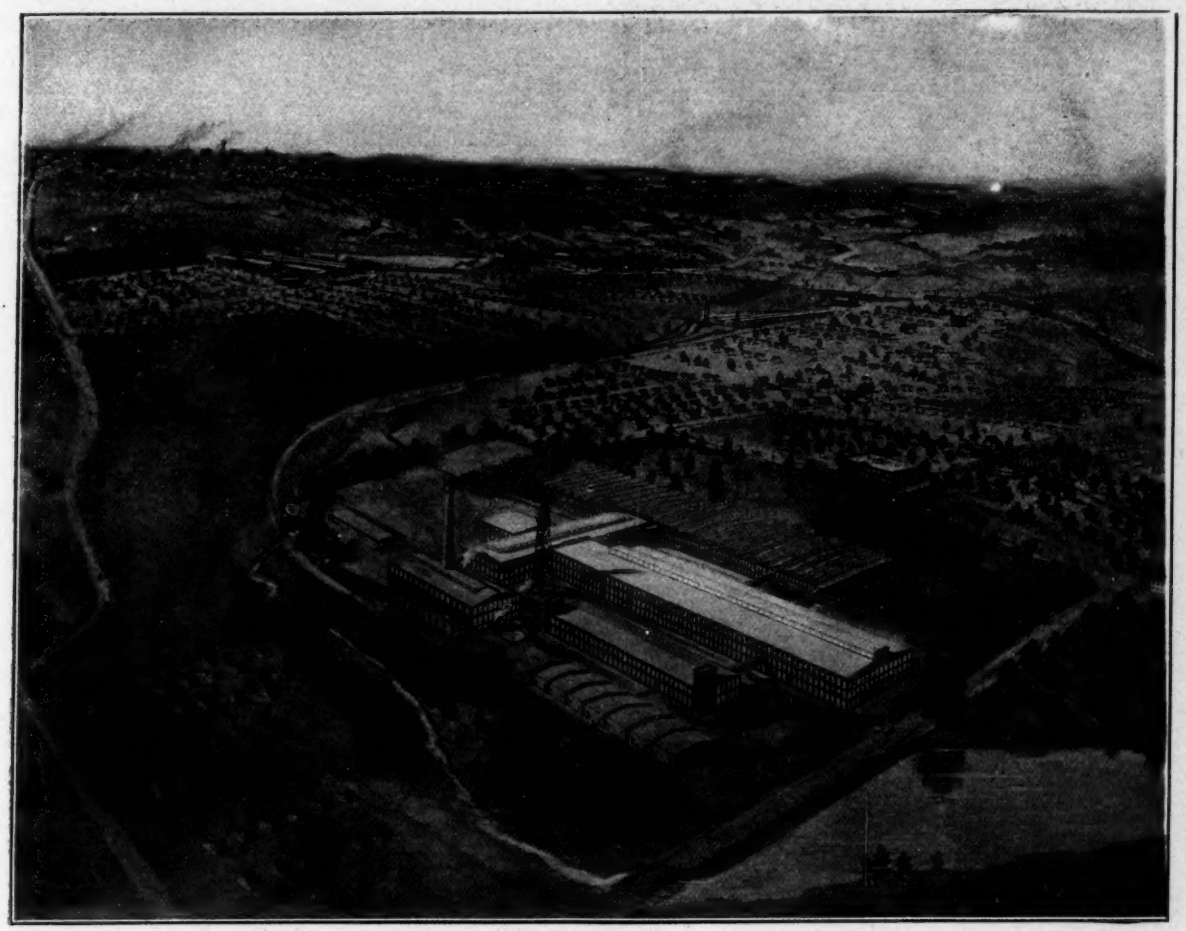
The stockholders of these mills have erected a new mill at Proximity, containing 25,000 spindles and the necessary preparatory machinery. The building is 130x428 feet, three stories high, and the capacity of the White Oak boiler and engine room has been doubled and electrical power on high tension wires is being transmitted from it to the Proximity plant, both the old and the new buildings, thereby allowing the running of both mills from one power plant.

The new mill is equipped with Kitson lappers and finishers; Whitin cards, drawing and spinning; and Woonsocket speeders and slubbers, for making yarns for use in the manufacture of denims at the Proximity plant.

The advent of the Cones at Greensboro took place in 1895 in the purchase of the property of the North Carolina Iron and Steel Works, and immediately commenced the erection of the Proximity Mills.

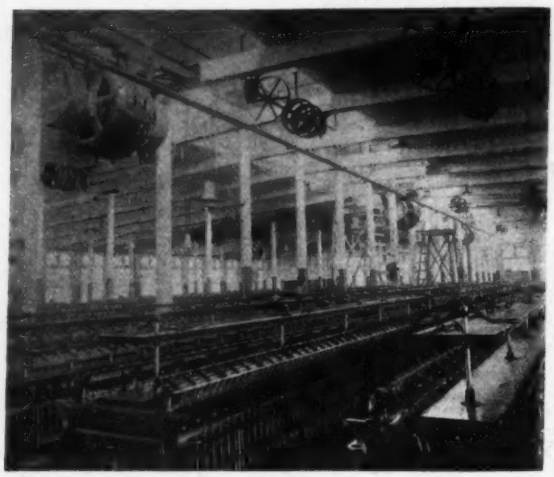
The White Oak Mills are the largest denim mills in the world, having 2,000 looms, and the Proximity Mills have over 1,100 looms. The two mills employ over 4,000 hands, and consume annually 28,000,000 pounds of cotton. The above mills are well equipped in every respect with modern machinery and appliances.

The White Oak Mills were completed in 1905, and have a complete electrical equipment for power and lighting purposes. Four hundred arc lamps are installed, equipped with concentric diffusers, enabling work to be pursued under the same conditions that hold with natural lighting. The weave shed of these mills is one of the best arranged in the country of a size capable of containing 2,000 looms. At present there are 1,350 28-inch looms, driven by four 150-horsepower, 550-volt, induction motors, supplied with four pulleys each. In the same building is the finishing machinery operated by one 75-horsepower, 550-volt, induction motor with two pulleys. The humidifier system is supplied with power by a 50-horsepower, 550-volt, induction motor.



PROXIMITY MANUFACTURING COMPANY, GREENSBORO, N C

The building connecting with the weave room near the center is the dye house. This contains 100 indigo dye vats. These are supplied with a 100-horsepower induction motor operated at 550 volts. This motor has also two pulleys for belt connections. On the second floor of this same building are fourteen slashers and thirty-six beaming frames, driven by a 100-horsepower, 550-volt induction motor with two-pulley equipment. Joining the dyehouse and parallel with the weave room is the spinning building. In the two stories and basement comprising this building



SPINNING ROOM OF WHITE OAK MILLS.

are located 342 revolving flat cars, 288 deliveries (first drawing) and 1,296 slubber spindles, driven by two 200-horsepower induction motors with four-pulley equipment. There are 60,912 spinning spindles, driven by six 200-horsepower motors, with four pulleys each. This building also contains 2,592 slubber spindles and 144 deliveries which are driven by a 75-horsepower induction motor, as well as fourteen large warpers, 6 small warpers, and 16 spoolers, of 200 spindles each, supplied with power by a 100-horsepower induction motor with two pulleys.

Just beyond and parallel with the spinning mill is the picker building of two stories and a basement. This contains 27 openers, induction motor-driven. Two motors are used of 75-horsepower each. In this building also are 27 breakers, 29 intermediates and 29 finishers, equipped with two 200-horsepower, 550-volt induction motors direct coupled to the shafts.

For supplying current to these various motors, the company has installed its own power house, 120 by 180 feet, with an addition of 84 by 120 feet. There are thirteen Heine watertube boilers, 500 horsepower each, giving a total boiler capacity of 6,500 horsepower. The boiler feed pumps are electrically driven by a 75-horsepower induction motor.

The entire power equipment of the White Oak Mill consists of twenty-two 600-volt induction motors aggregating 3,500 horsepower. This power is generated at the White Oak power house and transmitted direct to the mill switchboard with no intervening transformers or sub-station.

After a thorough test at the White Oak Mills, results were so satisfactory that all the engines are to be removed from the Proximity Mills and electric drive installed.

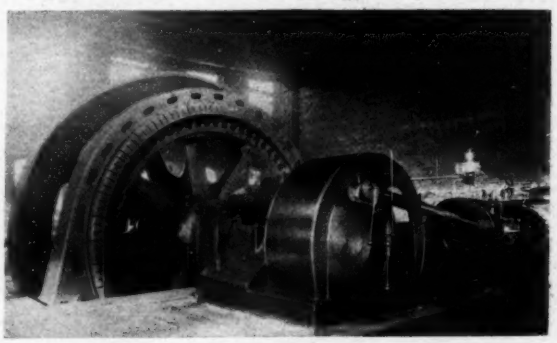
The Proximity Mills were designed for day and night spinning, while weaving was to be continued only through the day. The spinning capacity was only one-half the weaving capacity. The decision of the company to abandon night work necessitated doubling the spinning capacity. Another spinning building was erected and it was then decided to equip the new buildings as well as the old with electric drive so that there will be about 3,000 horsepower in induction motors at the Proximity Mill.

The Proximity Mills, although about two miles distant, are also supplied from the White Oak power house where two 1,500-kw. 600-volt General Electric engine-driven alternators were added to meet the increased demand. The generated voltage, stepped up from 600 to 15,000 volts for transmission, is to be held constant by a Tirrill regulator. At Proximity there has been erected a sub-station to step the line voltage down to 600 volts and supply it to the motors at this pressure. The sub-station also contains a 40-kw. 250-volt rotary converter used for lighting. Both ends of the transmission line are equipped with 15,000-volt General Electric lighting arresters.

The White Oak power house now has an output of 5,500 kw., generated by a General Electric alternator connected to two horizontal cross-compound engines, built by the Filer & Stowall Co., Milwaukee, Wis. The exciter plant, which originally consisted of a 50-kw. engine-driven generator and a 50-kw. induction motor driven generator, has now been increased by the addition of a 125-kw. induction motor-driven exciter.

The twelve original switchboard panels have now been increased to fifteen, all of black slate, and equipped with suitable controlling indicating and recording instruments. Thirteen panels of this same type were also installed in the sub-station at Proximity.

Most satisfactory lighting is secured in the White Oak



FILER & STOWELL CO.'S HORIZONTAL COMPOUND ENGINES.

Mills by the 400 General Electric arc lamps. The Proximity Mills will be furnished with 450 direct-current arc lamps supplied from the rotary converter in the Proximity sub-station. Preparation is also being made to supply night lighting to the village, and for this purpose a 250-kw. three-phase engine-type generator will be removed from the Proximity power house and installed at the White Oak station.

The two horizontal cross-compound engines, referred to above, are Filer & Stowell Co.'s "1900" heavy duty rolling mill type, and have been in use in the White Oak Mills since 1904. This company is now building for these mills two more engines, the exact duplicates in all respects, and

which are to go into the same power station, alongside of the two now in operation. The generators for the two engines now building, however, are to be 1,500-kw. each, so that when the four engines are in operation, this power station of the company will have a capacity of 8,100 horsepower.

ADVERTISING TEXTILES TO THE CONSUMER.

Judiciously Planned Advertising Gives Commensurate Returns.—Examples of Success.—Goods Must Merit the Claims for Them.

Written Especially for COTTON by Stanley R. Latshaw, of the *Ladies Home Journal.*

(*Continued From December, 1907.*)

In the preceding installments we have spoken of the advsability of identifying your goods, and the desirability of adopting a general trade name or brand, which will cover the full line, so that any advertising you may do for one particular fabric would tend to create value for the whole line, when next it might be exploited.

One of the objections the writer meets very often, when discussing advertising with manufacturers of textile fabrics, is that in the opinion of the manufacturer he has nothing worth while advertising. In other words, his line is staple and practically like a score of other men's makes.

Recent chemical processes, while more or less widely known throughout the trade, more oftentimes over-looked. We can apply certain of these to the cotton industry and while it is true that the expense will be somewhat greater on this particular line, the margin of profit can be vastly increased.

In point of tonnage, the actual production of Ivory soap is but a fraction of the business of Proctor & Gamble, but the profit on this small amount is more than that made on all the rest of their lines combined. This case would very often be true in the textile field.

We have recently made suggestions, along this line, to manufacturers of knit underwear (both in cotton and wool; to ribbon manufacturers, to three or four silk manufacturers, and to several makers of narrow fabrics. These suggestions often appeal particularly to a small mill, where the invested capital and the actual output are not enough to justify a broad national campaign on some comparatively staple article.

It takes lots of money to handle a big proposition, but, of course, if it is judiciously planned, the returns are commensurate with the expenditure. Wth the smaller house, something in the novelty line, where the margin of profit is far greater and the necessary outlay much less, these ideas are most welcome. One of the things, which we have pointed out as the cause of retarding the development of textile advertising, is the lack of knowledge on the part of the trade, as a whole, as to the success of those few who have advertised. Almost invariably a most secretive attitude is attained, and while this department is conversant with the details in most cases, it is often under the pledge of confidence, so that the splendid results of consumer advertising cannot be made public. There is, however, one notable success, which we are permitted to speak of freely. That is, the campaigns for "Onyx" hosiery and "Merode" underwear, conducted by the wholesale department of Lord & Taylor, New York City. J. H. Emery recently told the writer that "there is no statement so extravagant in praise of consumer advertising that we would not subscribe to." About eight years ago this firm commenced exploiting their "Onyx" hosiery. At that time their business in the two lines mentioned was, annually, $400,000. Their initial advertising appropriation was about $8,000 to $10,000. This year they are spending something over $100,000 for advertising in national mediums, and their total sales in these two departments run over $8,000,000. The last three years their sales have increased about $1,125,000 each year. Mr. Emery gives the great measure of credit to his judicious advertising, although the merit of the goods must be there to insure permanent success.

Many similar instances of success could be cited, although there are few so marked. The reason for mentioning this particular firm's campaign lies in the fact that it is advertising a general staple commodity, and to show the results that have accrued in this particular case.

The "Holeproof" hosiery campaign, with their six months' guarantee, was another notable success, on much smaller lines, but with considerable less of an outlay.

The firm of Joy, Landgon & Co. have made a success of their advertising, which is a revelation, for their expenditure was small indeed and the returns on the investment were enormous. This particular campaign is well known in the New England section, and we presume has been heard of in the South.

There is no special need to cite the case of any particular textile advertiser, except as it may show general conditions and that a success can be made with a small, well-spent appropriation, and a greater success with a greater expenditure of money.

The value of an advertising man as a counsellor lies, to a certain marked degree, in his wide experience with his many advertised lines and the mastery of principles and results of campaigns, under all sorts of varying conditions. This experience is of inestimable value, when properly applied to the case of a prospective advertiser.

The creative advertising man today is, of necessity, broadly educated. It takes a particular temperament and a good many years of diligent application to properly equip this man for his work, and yet the fundamentals of advertising are so simple that they are oftentimes overlooked.

The general synopsis of an advertising campaign would be to trade-mark your product or identify it in some individual way, and then to exploit the merits of the goods and the mark of identification to the consuming public. The so-called inside work, which is of vast importance, is in properly acquainting the retail trade with what you are doing, what you have to offer, its advantages and your plans for the future. This is done by means of trade advertising, direct representation and follow-up literature.

So far-reaching in details is national advertising, that it has become a highly specialized business, and to meet the requirements in the case, there are advertising agents, incorporated with ample capital and complete organizations, to solicit and handle advertising appropriations. Some of these agents pay big salaries to competent men, and their

success has been so pronounced that about ninety-five per cent. of the business carried by national publications is placed by the advertising agents.

The agent secures his compensation by a discount allowed him by the leading publishers. The reason for allowing this discount may serve as an illuminating light on the attitude of the publisher. He pays the agent a discount in order that the advertiser may receive the best possible service, which, if well calculated, insures success, which success redounds to the yearly profit of the publisher. Gradually the tendency of the times would seem to indicate a further specialization on the part of the agents, from the general agency of today to the specialized agency of the future, where one or more kindred lines of industry will be taken as the ground work for the agency campaign, and its customers drawn from these certain industries.

The dawn of the advertising day is just breaking in the textile field. As to what the condition will be at high noon, even the most optimistic cannot state.

ENGLISH PROJECT FOR CULTIVATION OF COTTON IN THE UNITED STATES.

An interesting project is under consideration by certain Lancashire, (England), cotton spinners, whereby there is a possibility of their demonstrating the advantages of improved methods of cultivation, baling, and handling of cotton, on an estate of their own.

A company is in course of formation to acquire the Heathman cotton plantation, situated in the Sunflower country, about 20 miles from Greenville, in the State of Mississippi. The estate is about 7,500 acres in extent, of which about 3,750 acres are under cotton cultivation, the rest being devoted to hay, sugar cane, potatoes, produce, and timber. During the Atlanta cotton conference this estate was visited by a number of the delegates, who were favorably impressed with it.

The cotton grown on the estate is what is known as "Bender," with a staple from one and one-eighth to one and a quarter inches. The first 1,000 bales this year were sold at 15⅛ cents. The crop averages three-quarters of a bale per acre.

The share capital of the company is to be $500,000, divided into $5.00 shares. There will be no public issue, and the capital will be held by spinners who are members of the International Federation, but no individual holding, it is suggested, should exceed $2,500.

At a recent meeting of the committee of the International Cotton Congress held in Manchester, it was unanimously voted that "The members of the committee, having heard the reports of Arthur Kuffler and Arno Schmidt on the subject of purchasing a cotton plantation in the United States of America, to be controlled by a European company, heartily approve the principle of such an undertaking as the speediest means of bringing about, in the interests of the cotton industry of the world, the reform advocated at all the international cotton congresses, and will invite the members of their associations to take an interest in the proposed company."

The "Textile Mercury," Manchester, comments on the above movement as follows: "Two projects of considerable interest to the cotton industry of Lancashire are now making progress. On the one hand there is a proposal to purchase cotton farms in the United States; and on the other hand it is indicated in the latest report that the construction of the Nigerian railway—to connect the new cotton fields with the coast—is proceeding most satisfactorily.

"On the face of it, these two movements seem not exactly compatible with one another; but the promoters of the establishment of Lancashire owned cotton farms in the United States assure us that the work is not being carried on in any spirit antagonistic to the objects of the British Cotton-Growing Association. While it may not be purposely antagonistic to the colonial cotton movement, it may nevertheless tend to lessen the interest that has been directed towards the development of colonial cotton belts.

"The purchase and management of cotton estates in America may well offer many advantages attached to them for English and European spinners; and now that spinners are likely to invest in this business, it need not surprise anyone who has followed the investigations of the Lancashire (Private) Cotton Investigation Commission. It was, no doubt, just as well that the commission should not give prominence to this business feature of their inquiries until they had some assurance that the object would be carried through. It has now been taken up by a number of influential Lancashire spinners and manufacturers, and has practically passed into the hands of the International Cotton Committee.

"Naturally something in the way of an apology is offered to British and European cotton-growing associations. The promoters of the new scheme argue that the management of an estate in America will be the means of obtaining information and experience in the cultivation of cotton. It will also afford (they say) 'a valuable demonstration to the American planter of the great economies it is possible to effect in the ginning and baling of their valuable product.' These are good reasons, but they are probably not the only ones; and, after all, the British Cotton Growing Association would prefer, no doubt, that such schemes were more associated with opportunities in colonial fields. On the other hand, it may be argued that the colonial conditions are not ripe for such a project; and accordingly, while our King's dominions over-sea are being made more accessible to the requirements of Lancashire spinners, the proposal to purchase cotton farms in the United States will probably commend itself to those who are acquainted with the objections which have long been associated with the marketing of American staples.

"Nevertheless, the promoters of this new scheme must be prepared to find it regarded in Lancashire as a "slap in the face" for the British Cotton Growing Association; while in London and the southern counties it will be used to point the every-ready gibe and justify the all-too-common sneer at Lancashire as a county more devoted to money-spinning than to patriotism!"

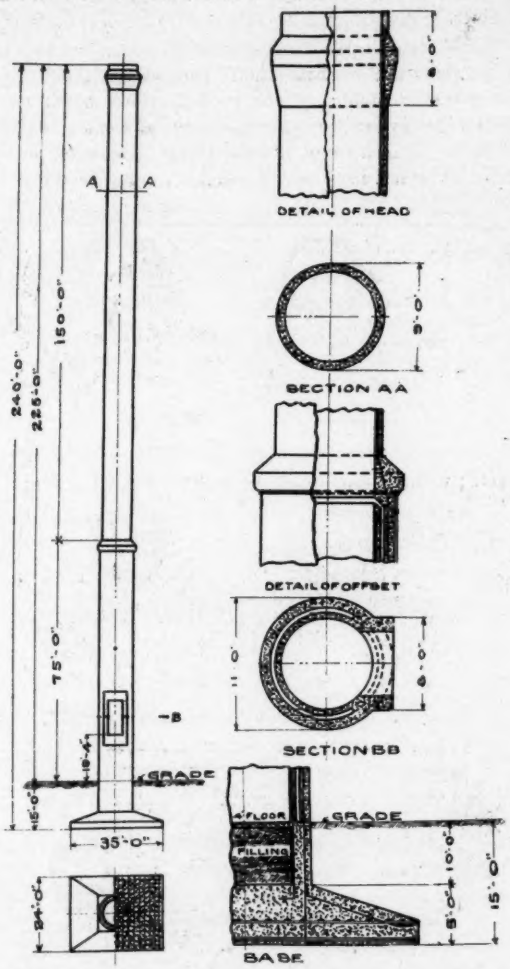
The man who knows enough to fit his advertisement to the changing moods of the times, is a man of genuine ability. He must study the public not only materially, but psychologically as well.

The exportation of hosiery from Chemnitz to foreign countries, which began in 1820, has grown to large dimensions.

CONCRETE CHIMNEYS.

The accompanying illustrations show a style of concrete chimneys erected by the Weber Steel-Concrete Chimney Co., Chicago, Ill.

The sectional drawing shows a chimney built for the Fulton Bag and Cotton Mills, Atlanta, Ga., and will give a practical idea of the details of construction. It is 225 feet high above grade, consisting of 75 feet of double shell and 150 feet of single shell. The foundation goes to a

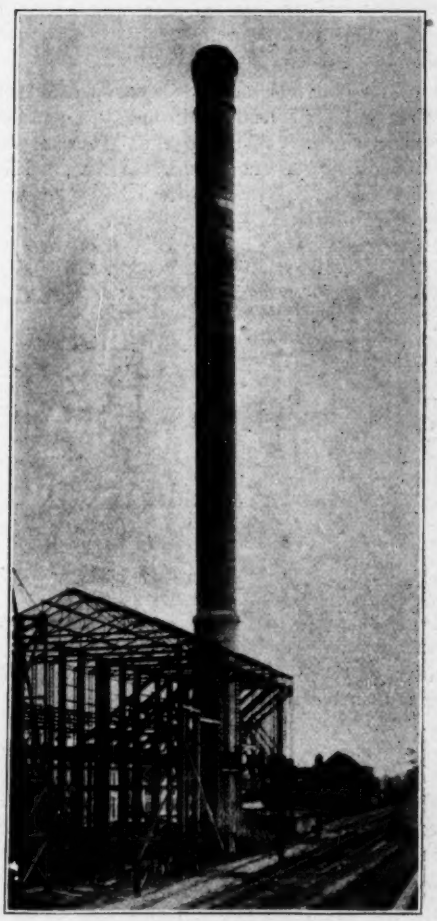


depth of 15 feet below the grade and is oblong, 35 feet in one direction and 24 feet in the other. It is customary to make the foundation for a chimney square, but in this instance it was made oblong on account of the restricted space available.

The double portion consists of an inner shell and an outer shell and an air space separating them. The outer shell is 10 inches thick, the air space 4 inches thick, and the inner shell 4 inches thick. The inner shell is not connected with the outer shell in any manner, excepting at the foundation, thus being free to expand and contract with the heat of the gases and protecting the outer shell from direct influence of the heat. The outer and single shells are practically one shell with a change of diameter at the off-set where the single shell is constricted to make the inside diameter uniform with that of the inner shell. The single shell is 6 inches thick.

The reinforcement of this chimney consists of vertical bars and horizontal rings. The vertical bars being 1¼x1¼ x3/16-inch T's, the horizontal rings being ⅝-inch rounds. The vertical bars are placed in bundles, the number in any section depending upon the height of that section above grade, the maximum number of vertical bars being at the grade section and the minimum number at the top. The horizontal rings are spaced 18-inch centers all through the chimney.

The smoke opening for this chimney is located 19 feet 4 inches above grade and is 6 feet wide by 11 feet high. The vertical bars of the outer shell run down into the foundation where they interlace with two net works of bars in the foundation, the first net work being diagonal and the upper net work laid parallel with the sides of the foundation.



CONCRETE CHIMNEY, ARLINGTON MILLS, LAWRENCE, MASS.

The foundation consists of a mixture of one part Portland cement to two parts of clean, coarse sand to four parts crushed stone, making a very hard and durable concrete. No crushed stone, however, is used in the concrete in any of the shells. The cost of this chimney, including foundation, was $7,500.

The accompanying perspective view of a concrete chimney is that of one built for the Arlington Mills, Lawrence, Mass. It is 250 feet high and 11 feet inside diameter, the reinforcement and system of construction being similar to that above described. This chimney has attracted a great deal of attention on account of its size and method of construction, and of its being one of the largest chimneys of its type that has been built for a cotton mill.

COTTON MANUFACTURING

CLEARERS FOR DRAFT ROLLERS ON DRAWING FRAMES.

BY SAMUEL WARD.
First Honors Silver Medallist and Clothworkers' Company Prize. Lecturer in Cotton Spinning.

(*Concluded From October.*)

The success of the revolving clearer in connection with spinning frames probably accounts for the application of this type of clearer to the draw frame (Fig. 4). Two rollers *F, F1,* are mounted on and carried by the clearer cover *G*. These rollers are encircled with cloth and rest lightly in contact with the rollers.

The effectiveness of this clearer is impaired, somewhat, by the smallness of the diameter of the clearer roller *F,* between the first and second draft rollers, necessitating such an enormous speed. *F1,* although of the same diameter does not suffer in this respect, because the conditions are not quite the same.

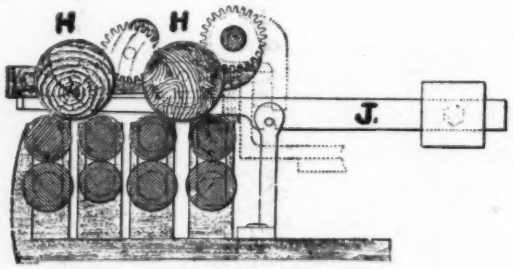


FIG. 5.

Fig. 5 shows a decided improvement on the clearer shown in Fig. 4. It consists of two wood rollers *H* covered with clearer cloth, resting upon and driven by friction between the third and fourth rollers, and *H1* mounted similarly but positively driven. The speed of this latter is different from that of the drawing rollers and in thus revolving collects the waste and forms it into a lap on its surface. The pressure of the clearer upon the drawing rollers is regulated by means of a balance lever *J,* as shown. In addition to the action already described the clearer cloth receives a longitudinal traverse which adds to its success. This clearer has been extensively adopted in mills using Egyptian and Sea Island cottons.

Another and later type of the revolving clearer is shown in Fig. 6. This consists of two cast-iron shells *K, K1,* the ends of which are milled at an angle as shown in Fig. 7 at *L, L1.* The cast-iron shells are covered with a sheath of clearer cloth. On being placed in contact with the rollers the shells are caused to revolve, and by reason, jointly, of their peculiarly shaped ends and the fixed pins *M, M1,* receive a slight lateral traverse in addition to the rotary motion mentioned. This type of clearer though introduced principally for drawing frames has obtained a more complete success on slubbing, intermediate and roving frames, on account of the slower speed of the draft rollers on these machines.

The Ermen clearer, details of which are given in Figs. 8 and 9, is one of the best known, and, we think, one of the most generally adopted of any type of clearer which claims to be an improvement on the stationary flat clearer as shown in Fig. 1. It consists of a wood roller *N,* mounted in and carried by a cast-iron cover *O,* and a porcupine roller *N1,*

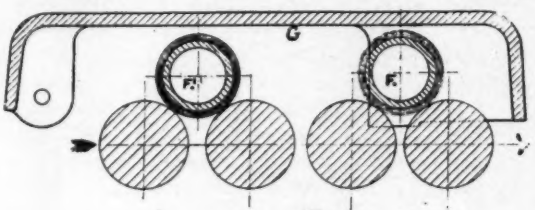


FIG. 4.

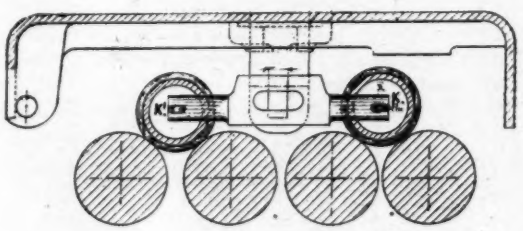


FIG. 6.

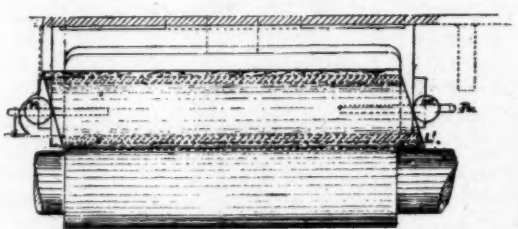


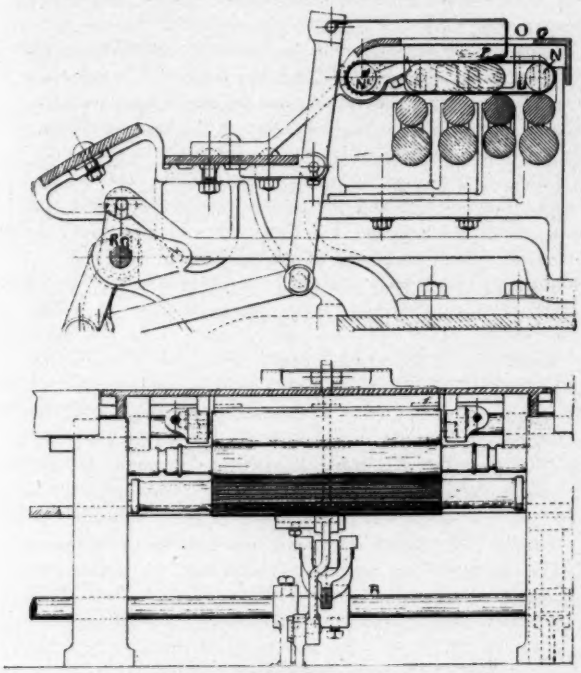
FIG. 7.

this latter being positively driven—usually from the back roller. An endless clearer cloth is stretched around the two rollers *N* and *N1,* and therefore receives a definite motion. The porcupine roller is driven from one end of each head, but although this is the case, the roller is jointed at each delivery in such a way as to be readily removed, if such a course is necessary in case of accidents, or for any other reason. The cast-iron cover *O* has a square hole in it, which allows the top side of the clearer cloth to be exposed, and also permits of the comb *P* resting on the surface of the cloth. The above conditions alone would be sufficient to secure the necessary stripping of the clearer cloth by the comb *P,* because the travel of this cloth is in opposition to the teeth of the comb. To insure, however, that the work be done in the most efficient manner possible, the comb *P* is given an oscillating motion, which, as will be seen from

Fig. 8, is obtained from a knock-off shaft *R*, which is part of the mechanical spoon stop motion. The forward motion of the comb is useful in clearing the comb itself of any tendency on the part of the waste to cling to it. In the backward movement the cleaning action of the comb is brought into play. This clearer is probably the most thoroughly reliable and effective of the series described in this article, and two outstanding features which help to make it so are:

1st. That the clearer cloth is constantly presented to the draft rollers free from fly or accumulations of waste of any description.

2nd. That the dependence for its success on the attendant is practically nil.



FIGS 8 AND 9.

The importance of cleanliness cannot be too rigidly enforced, and if this fact be appreciated by those in authority in the mill, to the extent of a frequent personal investigation, their trouble will be amply repaid, because a stronger and more regular yarn will be the result.

DOUBLING AND HUMIDITY IN COTTON MANUFACTURING.

BY E. A. POSSELT.

The cotton fibers, if examined by the naked eye, have an appearance similar to that of fine silky threads; but when placed under a microscope, a great difference in the appearance is noted, each fiber being seen as a long and relatively narrow flattened tube, spirally twisted about its axis. However, there will be found a marked difference amongst the fibers examined, no two being precisely alike, more particularly if their cross sections are examined. The length of cotton fibers vary from about ¾ of an inch to 2½ inches, and upon this length, commercially known as "staple," the value of the respective lot of cotton depends to a great extent.

The spinning property of cotton fibers largely depends upon their spiral character, which feature greatly facilitates their interlocking and increasing their grip upon one another. The direction and the amount of twist varies, increasing with the maturity of the plant. No turning of the axis takes place in the formation of this twist, the same being the result of the action of natural laws acting externally, and is not an inherent feature or essential part of the life of the plant. Owing to this presence of natural twist, cotton can be distinguished from other fibers, and can be readily detected by means of the microscope in yarn or cloth, whether in a rough, dressed, dyed or undyed condition. Wild silks, however, have frequently a very similarly flattened and twisted fiber, and may frequently be mistaken for cotton, if the microscopic appearance alone is relied upon, but the two fibers can be readily distinguished by chemical tests. Mercerized cotton presents an entirely different appearance to cotton in its natural state, due to the chemicals and treatment employed in mercerization.

The commercial value of cotton is determined by the length and fineness of the fibers, as well as the amount of impurities. There are several principal factors in good cotton, viz: length, uniformity, strength and flexibility of staple, color and cleanliness. The length can be ascertained by the gradual working of a tuft by the fingers until the fibers are drawn to a state of uniformity. To do this well only requires a little practice, and no explanation can make anyone perfect. If the fibers are of uneven length the cotton is of less value than if it were a little shorter, but of greater evenness, since an uneven staple will make trouble in the drawing processes, the carder having to set the distance between the bite of the drawing rolls to suit a certain length of staple under operation.

The flexibility of the cotton can be ascertained by the feel, which will show if it is soft or harsh, this again being a matter only acquired by practice. Flexibility does not necessarily imply a lack of strength, which some might regard as a more essential factor, but rather includes it. A weak fiber would not be a flexible but a brittle one, and without considerable strength, flexibility in the true sense cannot exist. On the other hand, a fiber might be strong and harsh and yet not flexible, being, therefore, not so suitable for spinning.

Warp yarns, as a rule, are spun for higher counts compared to filling, and the higher the count spun the greater the necessity for a long, uniformly even staple. Again, the warp yarn has to stand considerable strain during weaving, a feature not required by the filling, hence the strongest cottons have to be used for warp yarns. Filling, although required to be made from fibers of proper length and strength, in order not to influence the strength of the fabric, requires a soft and flexible fiber.

Counts of yarn below 20's are usually spun from "ordinary" short staple cotton, and will not stand the amount of draft and doublings in the different processes as finer counts of yarn spun from longer staple cotton. In fact, short staple cotton will only stand a limited amount of doubling and drawing, while medium staples will stand a larger amount, and the longest staples the maximum amount of doubling and drawing.

On the drawing frame, the number of processes used for

low counts is usually two, instead of three as used in connection with higher counts.

In a great many mills making low counts of yarn, the fine roving frame is omitted, the yarn being spun from the intermediate frame bobbins, i. e., only two processes of roving or fly frames are used, viz: the slubber and the intermediate, in place of the three process system as used with medium or above counts.

The doubling of the stock on the different machines is a matter of importance, since on the doublings depend the evenness of the yarn. The intermediate scutcher is the first machine in which the stock is doubled, four laps being fed on it and doubled into one, and this operation is repeated in the finisher scutcher. No doublings are made at the card, the lap being drawn out and condensed into a sliver at the coiler head. At the drawing frame, six of the card slivers are fed into one at each delivery, the second process of drawing being similar to the first. No third process is used on these low counts of yarns. On the slubber again no doublings are made, but on the intermediate and fine frames two strands of roving are doubled into one, and the same is done on the ring frame, although in some instances single roving is used. In the construction of yarn thus made, it will be found in this case that 4,608 doublings are made in the various processes from the time the lap, as coming from the breaker scutcher, is put on the apron of the intermediate scutcher, until the yarn is spun. The following calculation will show how this result is obtained:

Intermediate scutcher	4
Finisher scutcher	4
	16
First process of drawing	6
	96
Second process of drawing	6
	576
Intermediate frame	2
	1152
Fine frame	2
	2304
Spinning	2
Doublings made	4608

Provided, as done in connection with very low counts of cotton yarns, the fine frame then was omitted and the yarn spun direct from the intermediate frame, the number of doublings only made would then have been reduced to 2,304, and provided single roving is fed at the ring frame, this number is still further reduced to 1,152 doublings only.

Again, if a three process drawing is used, the doublings made then would be 4x4x6x6x6x2x2x2 or 27,648 doublings made, a feature which cannot help but show us at once the importance of this extra process with reference to a more even yarn.

In the manufacture of fine counts of combed yarns spun from Egyptian or Sea Island cotton, a sliver lap machine and a ribbon lap machine is used in connection with the comber, which machines increase the number of doublings immensely, for which reason it will be interesting for the reader to note the number of doublings that are then made in the manufacture of such yarns. There are from 12 to 19 slivers fed to the sliver lap machine at one time, and ribbon lap machines are usually constructed with six heads, although in connection with extra fine work, we may come in contact with eight-head machines. Again, however, very frequently we will find that only five heads of the six-head machine are used since, in this instance, the ribbon as coming from each head, can be made somewhat heavier than if using the full six heads of the machine, hence the ribbons are less liable to break (with its consequent waste to the mill) in their passage to the lap winding motion, besides the individual ribbon which has to travel the greatest distance on the front table is the one then cut out of the machine, hence reduces liability of breakages.

The comber, the same in its principle of doubling resembling the ribbon lap machine, has six, and in some cases eight heads, each head treating one lap as obtained from the ribbon lapper, the combed laps from all the heads combining in the form of a single sliver at the coiler of the machine.

The differenee in the manner of doubling between the ribbon lap machine and the comber consists in that in the first mentioned machine, the cotton, as emerging from the drawing rolls of each head of the machine, in the form of a fine sheet, passes over a curved film or web conductor, as they are called, they being placed there to deflect the cotton film 45 degrees. As each sheet comes from its curved conductor or on the table, it passes through a pair of carrying rolls, and as the sheets pass along the table toward the winding mechanism, they become superposed on each other (each head delivering its film on the preceding one), and in this position pass forward together through the next pair of carrying rolls. The last pair of carrying rolls is near to and delivers to the winding motion, which in turn winds the combined sheets upon a spool, in the same manner as on the sliver lap machine, from which filled spools are fed to the comber.

(To be Continued.)

SPINNING ON THE BARE SPINDLE.

BY W. BLEAKLEY.

I have recently been permitted to inspect the working of a new patented system of bare-spindle travellerless ring spinning at the works of the patentees, Messrs. Ashworth and Whiteley, in Elland, Yorkshire, England.

An old ring frame had been altered to receive the attachment. It was spinning 60's weft, from American cotton, from a 6½ single hank roving, with 27 turns per inch.

The spindle is vertical and stationary. It rests in a special footstep, and its highest point projects through the thread guide. The rings are rotated by bands strung alternately round two revolving tin drums as in the ordinary ring frame. The rotating rings are of cast iron, weighing under two ounces, and run on cast iron bearings. Their lubrication is a conspicuous feature. It is practically constant, and with the rings once supplied with oil, they run for three months; and, being covered in, are inaccessible to fluff or dirt. Each spindle works on its own center, and is easier to drive than the lightest traveller.

There are no tubes, and no paste. At the start the

thread is just whipped round the spindle, and the cop is built up exactly as on the mule. The full cop is doffed just as from the mule. One expert witness described the machine as a stationary mule. When the cop is full the ring rail is raised above the level of the cop, and the cops are pushed up the spindle by hand. The rail is then lowered and a few turns are spun on the spindle below the raised full cop. The cops are then taken off the spindles. No superiority in the build of the cop is claimed, but the binding is firmer than in the ordinary mule cop. This firmer binding constitutes another important feature of the cop. If it be stabbed in skewering, or the nose of the cop be broken,—which in the mule spun cop would mean a spoiled cop,—this new ring cop can be righted with ease instantly. The traverse up and down,—28 coils up and 5 coils down,—can be varied, but these figures give the practical result. The improvement in the binding enables the damaged cop to be rectified readily with the minimum of waste.

The spindle can never touch the cotton thread. It is claimed that there will be less than half the ordinary piecing up, and that a broken thread can be pieced up in half the time taken in the ordinary ring frame.

So far as regards the drag, changes of counts, say from 20's to 100's, can be made quickly. There are no travellers to change. Simply turn a screw, and it regulates everything.

There is no Monday morning trouble. The machine will start spinning in a temperature of 60 degrees Fahrenheit, as though it had never stopped. No artificial humidity is needed.

A girl can mind 800 spindles and she can learn all that is necessary in five minutes. In first cost, and in driving power required it is similar to the ordinary ring frame.

The problem of the bare spindle is undoubtedly solved. The acute angle difficulty is overcome. A former attempt failed through the endeavor to spin the cop upside down. This entailed the use of a spindle with a reversed taper. Hence its failure. Expert spinners are enthusiastic about this possibility of obtaining a ring-spun weft cop ready for the shuttle.

KNITTING

ENGLISH AND AMERICAN SYSTEMS OF LATCH-NEEDLE FRAMES.

The main differences between the English and American systems of circular latch-needle frames for the making of rib fabrics are as follows:

The rib attachment to the English latch-needle circular frame consists of a rib cylinder and dial which is revolved at the same speed from the frame cylinder. The rib needles work horizontally in the tricks of the dial and are soldered to swing jacks which are fulcrumed at the top of the cylinder. The whole of the revolving cylinder and dial is rotated round a center axle supported from the rear of the frame. The cams consist of plates part of which are secured on the inside of the jacks and part on the outside, or in some cases, where the jack has a projecting portion containing a slot, all the cams are placed outside. The jacks are steadied by working in tricks cut in two rings of the cylinder. The action to the needles requisite for knitting is obtained from (*a*) the inner cam which pushes forward the jacks to enable the needles to free the loop from the latch and at the same time receive its thread; (*b*) the outer knitting cam which is adjustable for the length of loop and which takes the jacks backwards to enable the needles to draw their loops and to cast off the old ones. The rib needles work between the frame needles and receive the same thread but by reason of their position knock over in an opposite direction, when not knitting the loop is generally kept securely in the hook with closed latch.

The rib attachment to the American system of latch-needle circular is much simpler than the foregoing and differs from it in the following respects:—(*a*) The needles have butts and are acted upon directly by the cams. (*b*) The cams revolve and the needles are stationary except for the necessary knitting movement in direction of their length. In this principle of machine the rib attachment is carried by an arm which is secured to the cam cylinder. The dial and cam plates hold a position around a center pin and the dial is prevented rotating by a lug on its underside coming in contact with a fixed but adjustable post. The rib needles work between the frame needles being pushed forward by an inner cam and pulled inwards to draw their loop by an adjustable outer knitting cam. When not knitting they are in their backward position with the loops in the hooks of the needles and in this respect occupy a similar position to those in the English system of rib circular frames. The cams can be prevented from rotating by the simple removal of a pin which holds them to the ribber arm, this again being an advantage over the English system.

FACILITATING ACCESS TO NEEDLES AND PLATE CAMS.

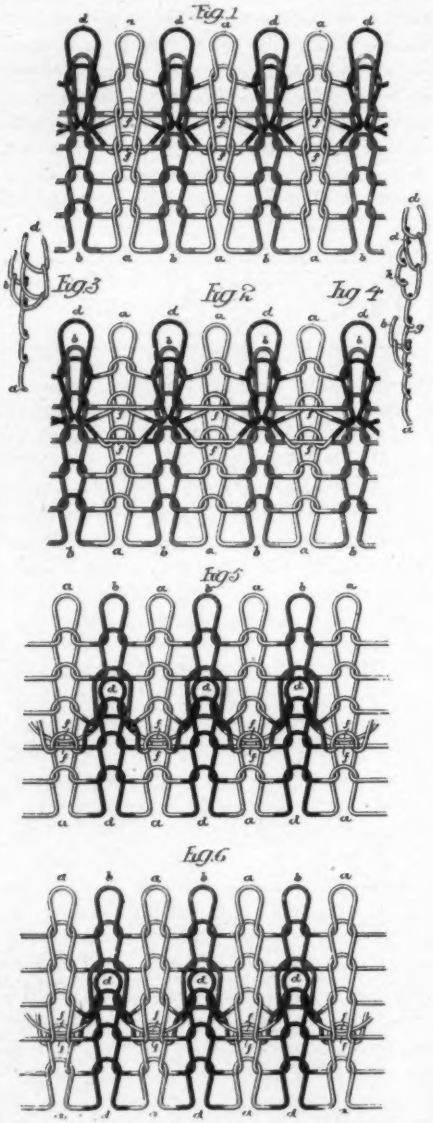
Improvements have recently been made in circular knitting machines for facilitating access to the dial needles and dial plate cams to permit inspection of the inner side of the tubular web which is being produced, to use, in a more effective manner than before, a templet and to provide efficient means for controlling the operation of certain of the cams of the needle cylinder so as to permit of change in the character of the stitch produced.

Both the dial and dial cam plate are in the present instance, of open or skeleton construction, being, in fact, constructed like a wheel with a hub, spokes and rim, so that through the openings thus provided, the attendant who is operating the machine can inspect the interior of the knitted tube which is being produced, and thus readily discover any defects in the knitting which would not be visible from the outside of the machine or discoverable by an inspection of the outer face of the knitted tube.

Mounted upon the rim of the dial cam plate is an outer detachable ring and upon the underside of this ring are mounted the cams for operating the dial needles, hence, whenever it is desirable to gain access to the dial needles or to the cams for operating the same, this object can be effected by simply raising a ring without disturbing the dial cam plate or its connection with the depending stem which carries the same.

PREVENTING THE RUNNING BACK OF STITCHES.

The object of the method here shown is to prevent the "running back" of stitches cast from the needles of a knitting machine in changing the character of the knitting, for instance in changing from plain web to ribbed web, by casting the stitches from certain cylinder needles, retiring the same and introducing dial needles in their stead, or in changing from ribbed web to plain web by casting stitches from the rial needles, retiring the same and introducing cylinder needles in their stead.



The change from ribbed web to plain web may be effected at the junction of the top and leg, or at the junction of the leg and foot of a stocking, and the change from plain web to ribbed web may be effected after the completion of a toe pocket upon a stocking tube, in which case the casting off of the stitches from certain cylinder needles may be followed immediately by the introduction of corresponding ribbing needles for the formation of the welt thereon, or any desired number of courses of plain web may be formed upon the remaining active cylinder needles before beginning the setting-up course. In either case a transfer operation is avoided and the production of the sock or stocking is therefore simplified and cheapened.

Supposing that the knitting machine upon which a composite ribbed and plain web is being produced is one having cylinder needles and dial needles, and that the plain web is being produced upon the cylinder needles, the stitches cannot simply be cast from alternate cylinder needles prior to the introduction of the dial needles in their stead, nor can the stitches simply be cast from the dial needles prior to the introduction of the cylinder needles in their stead, because the stitches thus cast off have nothing to retain them and will "run back" under the strain to which the fabric is subjected in the knitting operation, or in subsequent use, if such use is attempted. By "running back" is meant the pulling out of the cast-off stitches and the transformation of the same into elongated sinker wales intervening between the standing wales, so that there will be, at the point of junction between the plain and ribbed webs, a plain fabric of very open mesh, and of indefinite extent.

Such a method of changing from plain web to ribbed web or from ribbed web to plain web is therefore, commercially impracticable, and in order to overcome the objection noted, in acordance with one method of carrying out the scheme here presented, the formation of stitches on the standing wale needles is discontinued, while continuing such formation on the needles which are to be retired, this operation continuing for one or more courses, and preferably for a plurality of courses, before casting the stitches from and retiring the needles, the result being that the standing wales take the strain exerted upon the fabric, the discontinued wales being relieved from such strain and the running back of the stitches of such discontinued wales being thereby prevented.

In Figs. 1 and 2, of the drawing, *a* represent standing wales of plain fabric which are continued up into the ribbed fabric and correspondingly lettered therein, *b* representing discontinued wales of plain fabric, *d* rib wales which take the place of the latter, and *f* sinker wales passing from one discontinued wale *b* to another, the term "sinker wale" in this connection meaning the yarn between the needle wales.

In Figs. 1, 2 and 3, of the drawing, there is shown in the present method a web in which the change is made directly from continuous plain web to ribbed web, and in Fig. 4 there is shown an instance in which, after casting off the stitches of the discontinued wales *b*, a number of courses of plain web *g* are first knitted upon the remaining cylinder needles, and a welt *h* is then formed in the usual way, before beginning the production of ribbed web *d*.

Figs. 5 and 6, show a fabric in which the change has been effected from ribbed web to plain web, *a* representing standing wales contained in both webs, *d* discontinued rib wales, *b* plain wales which take the place of the discontinued rib wales and *f* sinker wales connecting the latter.

In the fabric shown in Figs. 1, 2, 5 and 6, the knitting operation is arrested simultaneously upon all of the standing wale needles of the cylinder and the terminal stitches of all of the discontinued wales are in the same course.

At least 600 firms in Nottingham, Eng., are engaged in the industry of making, finishing, or marketing lace.

TO MAKE A FASHIONED STOCKING.

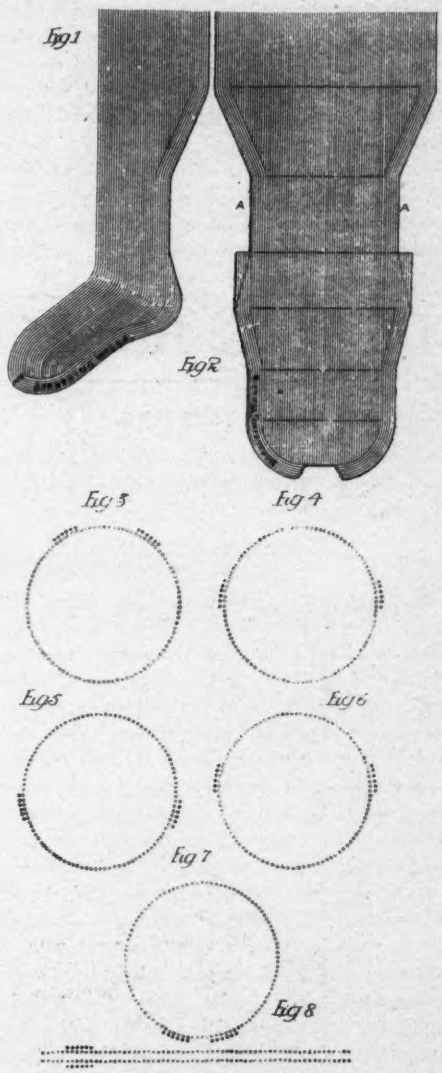
The acompanying illustrations show a new way for shaping or fashioning a stocking, being susceptible of manufacture by a continuous operation which produces a tubular web, upon either a flat or a circular machine, the web in the latter case being formed by rotating knitting instead of by reciprocating knitting, such as is usually resorted to in the manufacture of fashioned stockings. By making the stocking, or rather the blank of which the stocking is to be formed, upon one machine, there are avoided all expensive transfer operations such as are necessary when more than one machine is employed in the fabrication of the stocking blank.

Figure 1, is a view of the foot and part of the leg of a stocking, made in acordance with the present plan; Fig. 2, is a view of the blank from which the stocking is made; and Figs. 3 to 8 inclusive, are needle diagrams illustrating the method of knitting this blank.

It may be well to state at the outset, that in knitting what are termed "full-fashioned" stockings it is customary to commence the knitting at the widest portion of the leg, the knitting being performed upon flat machines having spring-beard needles and the strip being knitted of a uniform width until the calf portion is reached, whereupon the strip is narrowed by transferring groups of stitches from the end needles on both sides of the machine toward the center of the fabric, these groups of stitches being moved inwards, a needle at a time, between successive operations, until the fabric has been sufficiently narrowed for the ankle portion of the stocking, the latter being then knitted of uniform width until the formation of the heel is necessary. At this juncture, two yarn guides are thrown into action, one employed for knitting a projecting heel piece at one side of the ankle web, and the other for knitting a corresponding heel piece at the opposite side of said ankle web, the intervening needles of the machine having stitches cast from them. The heel strips are knitted of uniform width down to the point where the rounding of the heel is to be effected, whereupon each of the strips is narrowed to the desired extent by transferring groups of stitches in the same manner as when narrowing for the calf portion of the stocking. When the knitting of heel strips has been completed, they are cast from the needles and the selveged inner edges of the heel strips are run upon the outermost needles of a separate machine, known as a footing machine, the intermediate needles of this machine receiving the loops around the instep portion of the leg web which are thrown from the needles of the leg machine when the formation of the heel strip was begun. The foot web is then knitted upon the needles of the second machine, the web being narrowed at each side to form the desired instep gussets, and being so narrowed at the toe so as to properly round the same. This method of manufacture is a slow and tedious operation, necessitating the use of expensive machinery and the highest class of skilled labor to operate it.

The main aim of the method here employed has been to so form the stocking as to permit of the use, in its production, of a web produced by tubular knitting preferably upon a high speed circular or rotating machine in place of the usual, low speed reciprocating machine, and to effect the desired shaping or fashioning of the web without the necessity of using transfer points for transferring stitches from needle to needle or filling-up points for transferring a previously formed stitch of the knitted web to a naked needle, for the use of such transfer or filling-up points further reduces the production of the machine, since the knitting operation must be arrested while such points are in operation.

Referring to the drawings, it will be observed that the stocking illustrated in Fig. 1, is very similar to an ordinary full-fashioned stocking having the wide leg, a shaped calf, a narrow ankle, a wide heel, a narrow foot, a substantially seamless union of the webs across the front of the toe



and the sea mextending from the point of the toe underneath the foot and heel, around the corner of the heel and up along the back of the heel, ankle, calf and leg. In this stocking, however, there are no side seams at the front of the heel, as in the ordinary full-fashioned stocking, and the leg portion and foot portion are not made separately, the stocking being produced from a web or blank of the character shown in Fig. 2, and this web being made in a manner which will be understood on reference to Figs. 3 to 7 inclusive.

It will be noted in reference to Fig. 2, that the web has, at each edge of the same, bordering wales, which, when the web has been folded and seamed or sewed together to form the stocking, extend throughout the underside of the toe, the sole of the foot, the bottom of the heel, and the rear of the ankle, calf and leg of the stocking. The fashioning or shaping of the different parts of the stocking is effected by a widening operation, the various widening wales being introduced between the standing wales of the fabric and the bordering wales. The knitting of the web is commenced at the toe, and the machine employed for the production of the fabric is by preference a rotary machine with a pair of needle-carrying segments movable from and towards each other around a full or interrupted circle of needles in a cylinder (represented by the circular series of dots in Figs. 3 to 7,) forming the standing wales and the widening wales of the fabric, and the segment needles (black dots) forming the bordering wales of the fabric. The machine knits round-and-round, a limited portion only of the needles being in action at the beginning of the operation, and these needles being flanked by the bordering needles (black dots), the knitting yarn being carried across from one set of the latter needles to the other, and the floating yarns or elongated sinker wales being subsequently severed or trimmed off, with the result that, in either case, sinker wales or ends of yarn project from the bordering wales, as shown at A in Fig. 2, hence a characteristic feature of the stocking or blank, is that the outer edges, along the bordering wales, are unselvaged.

The annual convention of the National Association of Hosiery Manufacturers, and the Knit Goods Manufacturers' Association, will be held in Philadelphia on May 11-16, 1908. The membership of the Hosiery Association is now 225, representing 70 per cent. of the total United States production, and is growing rapidly. The Knit Goods Association, which embraces all lines of knit goods except hosiery, is not so large, being a much younger association, but its membership is representative and very enthusiastic. An exhibition of machinery will be held in connection with these conventions, and the cost for space in the exhibition hall will be on the basis of 50 cents per square foot—no limit to space. Particulars can be obtained by addressing C. F Carter, Secretary, 683 Drexel Building, Philadelphia.

DYEING, BLEACHING AND FINISHING

CALICO PRINTING.

The Cylinder Printing Machine.—The Bowl.—The Furnisher.—The Blanket.—The Doctors.—Methods of Printing.

BY HENRY G. KITTREDGE.

VI.

With the cylinder printing machine, which is the one now most universally used, the various dyes are applied to the fabric by means of an engraved copper roller (see September issue, page 348), or by a number of rollers each engraved with the portion of the pattern corresponding to the color gamut employed for the design. These rollers are adjusted so that the whole pattern fits and registers, each color being applied in its proper place.

The cylinder machine of today with its most modern improvements is capable of applying in one process as many as twenty distinct colors. In its best form it consists of a large iron bowl, or drum, against which are pressed the engraved copper cylinders; the latter being supplied with color by wooden rollers covered with cloth, or sometimes by cylindrical brushes called "furnishers." The furnishers revolve in the color, which is contained in long troughs called "color boxes," but as the furnishers supply the whole surface of the engravel cylinders with color, as well as the engraved parts, the surface color has to be scraped off again, and this is done by means of a steel blade, known as the "color doctor."

The cloth to be printed passes part way around the bowl of the machine, and between the engraved rollers and the bowl. It is whilst passing between the rollers and the bowl, or through the "nip," as it is called, that the cloth receives the color, and in order that the cloth may be well pressed into the engraving so that it may take out all the color, the iron pressure bowl must be well lapped with some elastic material. The lapping used for the bowl of the machine is a strong material made with a linen warp and woolen weft, about ten or twelve thicknesses of which is carefully wound on the bowl, without any creases or any unevenness of the nip. Between the piece of cloth to be printed and the lapping of the bowl an endless web or blanket is interposed. This is a thick, strong cloth, generally made of all wool, and should be of equal thickness throughout, as well as of uniform texture and elasticity. As the blanket has to be dried and cooled every time it goes round, it must of necessity be of considerable length (40 or 50 yards) and the ends must be very carefully sewn together, in such a manner as to leave no ridge, as any such ridge, crease, or any other unevenness would show in the print. The use of the blanket is to help the lapping in producing a good impression by virtue of its elasticity, to preserve the lapping, and to protect it from damage and dirt. Of course, the blanket itself becomes dirty or worn, so much so that it must be frequently replaced; but a good one will print 20,000 pieces before it becomes useless. Very often unbleached pieces of cloth (called black grays) are used for the purpose of keeping the blankets from getting dirty too soon; in which case the "black grays" are run between the blanket and the pieces which are being printed. Sometimes cotton cloth coated with india rubber (called mackintosh) is used instead of a woolen blanket, and for some kinds of work the mackintosh is preferred; one advantage of it is that, being waterproof, after every passage through the machine, it can be washed.

In order to remove any loose threads or filaments that may adhere to the engraved roller, a so-called "lint doctor" is used on the opposite side of the roller to which the color doctor is applied. These doctors are usually made of well tempered steel, and it is a very important part of the printer's business to get up, by means of a file and oil stone,

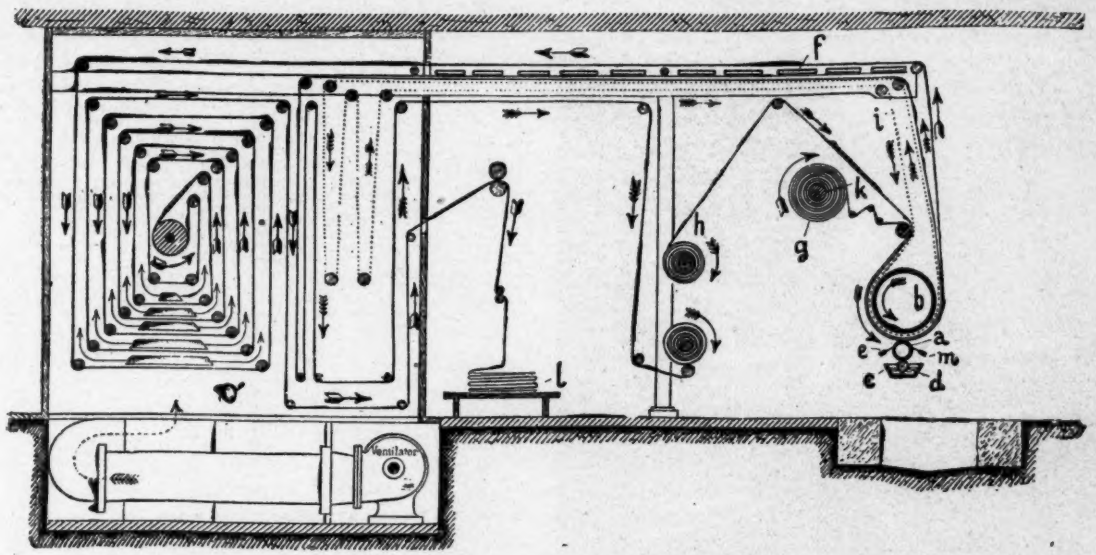
the doctor's edge in such a way that it may effectually remove the surplus color without doing injury to the engraved copper roller. Some colors (though they are becoming fewer every year) have a very injurious solvent or corrosive action upon the doctors' edge, which causes bad or streaky work. To remedy this, composition doctors of various kinds are used; but a good steel doctor is nearly always preferred whenever it can be employed, hence electro-plated steel doctors have come into use.

The blade of the doctor is held in what are called "shears," that is, it is clamped between two pieces of metal by means of pinching screws. The exact angle at which the doctor must press against the copper roller can only be determined by experience; but, as a rule, the color doctor is set sharper or more horizontal than the lint doctor; for as the roller runs from the edge of the color doctor and towards the edge of the lint doctor, the latter must not be set too keen or it would be liable to catch in the engraving, and so spoil the roller.

All color and clearer doctors have a to and fro longitudinal motion called "traverse." This traverse motion is generally worked from the center bowl by various methods, —as bevel wheels and cranks, eccentrics, sinuous cams and levers, etc. The object of this traverse motion is to enable any particles of grit to pass from under the surface of the doctor by the engraving of the roller, and to keep the edge of the blade evenly worn and clear.

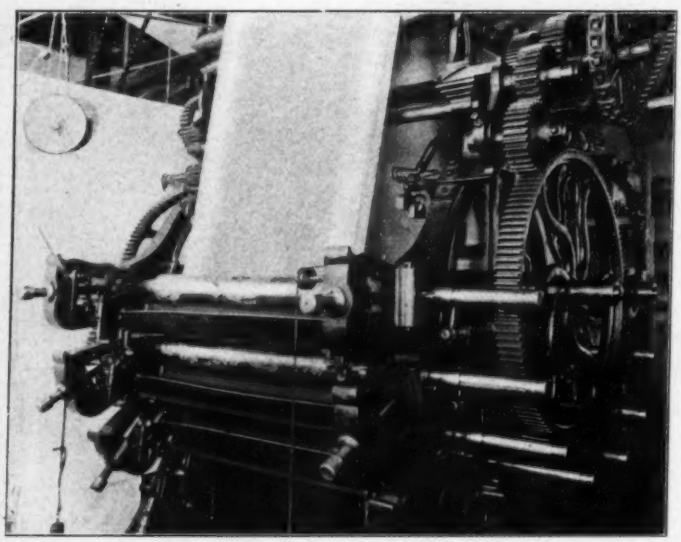
Each engraved roller is forced tight upon a solid axis called a mandrel, being the shaft upon which the engraved roller is revolved. These mandrels turn in bearings which are adjustable, so that the engraved surface of the copper roll can be pressed against the cloth under any degree of pressure required. These copper rolls are cylindrical shells of solid copper, which when new are usually ¾-inch to 1 inch in thickness. When the particular pattern is through with, or when it becomes badly worn, requiring re-engraving, as is sometimes the case, the face of the roller is cleaned by turning off a very light chip, and afterwards is re-polished, preparing it again for engraving. It is by this process that the copper roller is gradually wasted away until it gets too thin for use.

The pattern, design or style, may be obtained by (1) Printing, with engraved rollers or blocks, upon the fabric the already-formed pigment or color, along with a material to bind the pigment to the fiber known as the pigment style, and used chiefly for cotton piece goods. (2) Printing a dyestuff or color, which has itself an affinity for the fiber upon which it is printed, either alone or with the addition of other chemicals, added merely to assist the combination of the dye with the material upon which it is printed, known as the direct printing style. If the goods are afterwards submitted to the action of steam they are then sometimes classed as "steam style colors," used in the printing of all kinds of fabrics. (3) Printing a dyestuff mixed with certain substances, known as mordants, which upon subsequent steaming of the cloth produces the desired color, and at the same time fixes it in and upon the fiber, classed as a steam style, and applicable to cotton, linen, and occasionally to silk and woolen goods. The so-called adjective colors are applied in this way. (4) The dyestuff may be printed along with the other materials, which, by subsequent treatment and passage through certain salt solutions, cause the color to be formed and fixed on the cloth, also classed as a steam style, and comprising a class of colors fixed by means of tannic acid and final treatment with aromatic salts. The colors so applied are sometimes called tannic colors, and printed generally upon cotton and linen piece goods. (5) The color may also be built up on the fiber, in the parts required to form the design, by printing upon the surface of the cloth one component part of a coloring-matter, and afterwards passing the whole fabric through a solution containing the other necessary constituent of the color, the color being produced only where the two ingredients are present. The same end is obtained by first uniformly impregnating the fabric with one constituent of the color, and afterward printing the other constituent



A, ENGRAVED ROLLIER; *B*, DRUM; *C*, COLOR TROUGH; *D*, FURNISHER; *E*, COLOR DOCTOR; *F*, DRYING PLATES; *G*, CLOTH TO BE PRINTED; *H*, INTERMEDIATE CLOTH; *I*, BACKING CLOTH; *L*, FOLDED CLOTH; *M*, LINT DOCTOR; *O*, HOT CHAMBER

in the required patterns. This is also classed as a steam style. Colors produced by this method are frequently termed naphtho colors, and this term is applied to the colors built up in this manner, even if the chemical known as naphthol does not enter into the composition of the coloring-matter. Used principally for printing cotton pieces. (6) The cloth may be printed with certain metallic compounds which may be of themselves without color, but which can be converted into insoluble coloring-matters, or lakes, by the application of dyestuffs, known as the madder or dyed style, so-called because, before the introduction of artificial alizarin, madder was extensively used for the production of prints in this way. This method finds its chief application in calico printing. (7) The whole fabric may be evenly impregnated or evenly coated upon its surface with a metallic compound, and the pattern produced by printing upon the so-prepared cloth a material having the power of removing the coating, or of reducing the metallic compound to such a condition that it is not fixed upon the parts of



DUPLEX PRINTING MACHINE FOR PRINTING ON BOTH SIDES OF THE FABRIC AT THE SAME TIME. THIS IS AN 8-COLOR MACHINE, AND WILL PRINT FOUR COLORS ON EACH SIDE OF THE FABRIC.

the fabric printed with the material; thereby preventing, when the fabric is afterwards treated with dyestuffs, the formation of a color on the parts so printed. This is called a resist style, and is used largely in calico printing. (8) The tissue may be printed with a material, or mixture, having the power to prevent the fixation of color, or the formation of a color-lake; so that when the fiber is afterwards printed evenly, or in a pattern, with a color-producing mixture, the color is formed on those parts only of the tissue not printed with the resisting mixture. This is also called a resist style, used upon cotton piece goods, and occasionally upon silk. (9) Or, the resisting mixture may be printed after the cloth has been coated or impregnated with the color-producing substance, called the resist pad style, and used upon cotton and wool. To pad is to expose to the action of a mordant. (10) The tissue may be first dyed a uniform color, and then the color removed and changed, or removed and a different color formed upon the parts printed. This is called the discharge style, and employed in printing all fabrics. (11) Or, lastly, the pattern may be produced by a combination of two or more of the above methods.

WHY A TEXTILE MILL WANTS A CHEMIST.

DR. FREDERIC DANNERTH, *Consulting Chemist*, Formerly of the Philadelphia Textile School.

The institution of courses in chemistry at our textile schools and the instruction in textile chemistry at universities has ocasioned the oft repeated question: "What does a textile mill want with a chemist?"

Although several of our large textile corporations have for a number of years employed trained chemists in their works there is still a question in the minds of many as to the actual need for such a person in the mill. Many understand a chemist to be one who "mixes drugs and fills prescriptions," but this old English use of the term is rapidly disappearing and these persons are now called pharmacists. Some of us readily understand where a chemist may be of service to a manufacturer of chemicals, dyes and oils, but when we see him in the employ of the consumer of these articles his position seems rather superfluous. It has, however, become apparent that in order to stand the keen competition of the present day the manufacturer must keep his goods up to a high standard. To this end he must exercise strict supervision not only over his materials but also over his products. What is true of the manufacturer is equally true of the importer, the jobber and the department store. Within this thought lies the secret of the excellent standard of purity which is maintained by the demands of the consumers. Obviously, if a producer knows that his articles will be scrutinized and tested, he is very apt, in order to retain trade, to hold his products up to the standard specified by the customer. Experience has shown that many "merinos" ware, "all cotton" and many "pure soaps" contain 50 per cent. of water, so "that we cannot always rely on the word of the seller. It might be well sometimes to bear in mind the old Roman law which declares "every man guilty until he is proven innocent."

As an architect examines the materials which go to insure a perfect building, so the manufacturer should exercise control over every material used and over every process if his product is to be perfect and the cost of production to be as low as possible. If governments have recognized the harm done by adulterated foods and have passed laws to prevent their sales, why should not the mill man set a standard for the articles used in the various branches of his business?

The food question is of course one which touches our health while the "money value" of our clothing affects only our pocketbooks. But why should not the manufacturer ask himself—"Is the life of my machinery insured by the oil with which it is lubricated?" or "Am I insured against boiler corrosion and possible explosion by the water which is fed into my boilers?" or, "Am I temporarily removing the effect instead of permanently removing the cause, when I administer boiler-compounds to my boiler?"

In textile mills the consulting chemist is often called in to ascertain the cause of rottenness in bleached goods or the reason why certain dyed goods "rub-off" so very much.

The manufacturer is occasionally compelled to flee to the chemist for help because his goods have been rejected by an old customer whom he does not want to lose. In former years these problems were submitted to a general chemist, one who analyzed drugs, iron, foods and fertilizers. It goes without saying that, not being acquainted with the processes through which the goods had passed, he was usually unable to give a plausible explanation of the defect. The advent of the specially trained textile chemist changed all this; but we should not wait until it is too late and all the goods have been finished (and spoiled). There should be a constant control of the several processes and accurate records should be kept of all results and experiments. It is obviously impossible for many of our mills to have a competent chemist on salary for this purpose, so that the questions as they come up are referred to a consulting chemist who has made a specialty of textile problems.

And now let us see in what way he can be of value to the millman. Well to begin with, the fundamental necessity for the work he can examine the water. An analysis will show the presence or absence of lime, magnesia and iron, and will therefore determine the suitability of the water for boiler purposes as well as for scouring, bleaching and dyeing. Here we very often find the reason for "dyed fabrics which crock." The story of the harm done by lime is too well known to need repetition. Secondly, he can examine the oil used for wool spinning to see if it contains any of the harmful mineral oil so difficult to remove by scouring. Or he may turn his attention to the oil used for lubricating the machinery and determine the relative value of samples submitted. After that he may examine the soaps used on cotton, on wool and on silk, for these should possess ertain qualities, if they are to yield good results.

Sometimes it is desirable to imitate "merino" fabric, and then an acurate determination of the wool content of the sample should be made; or the question will arise "is artificial silk contained in this ribbon, if so, how much?" "What is the market value of this sample of 'antichlor'?" etc. The scourer wishes to know if the new source of water will be suitable for his purposes or if a certain new soap which has been offered at a lower price is safe to use. The dyer wishes to know if his dyestuffs are adulterated, in other words,—is he receiving glauber's salt or dyestuff for his money? It is well for him to know the character of his turkey red oil, his aniline oil, and his olive oil so that he may be better able to judge the prices at which they are offered. The finisher should know if his fulling soap contains free caustic alkali or other injurious materials; finally the printer should know whether he is receiving potato starch when he is paying for wheat starch.

Having thus pointed out the necessity of precaution and care in the selection of materials used, it is readily seen that where large quantities are purchased it is of the greatest advantage to have the supplies examined by a chemist, thus enabling the purchasing agent to rely on full information as to the quality of material furnished on his orders. The "claim" item and the losses often blamed on poor workmanship are things which he seeks to eradicate.

The work of the chemist may be divided first, into routine work, that is, the testing of materials and products, and, secondly, into experimental work in which new methods and processes are worked out. Under the first caption comes the "buying on specification." Specifications are formulated and issued to manufacturers with whom orders have been placed and they are required to furnish goods which in quality must be up to the standard of purity set forth in the body of the contract or the material will be considered "undesirable." Specifications should serve the purpose of holding the shipments up to what the producer has agreed to furnish the consumer. They represent material of an efficiency which has been recognized as desirable and necessary.

This brief review has given us a slight idea of the domain of textile chemistry, yet the value of the chemist to the manufacturer does not by any means end here. His testimony is relied upon in litigations concerning such textile questions as: The amount of cotton in "merino" goods; the adulteration of dyes and drugs; disputes concerning import duties on dye-wares and textile fibers. Then again he co-operates with the lawyer in contests involving the validity of patents. Of the numerous textile cases involving chemical testimony those on indigo, mercerized cotton, and artificial silk are the most notable.

MARKET REPORTS

SOUTHERN COTTON YARN MARKET.

At the time of writing our last month's report the trade was very dull and buyers showed little interest in any kinds of yarn for immediate or future delivery. Stock taking was also in process by most buying houses, and very little new business was being placed. Prices were also very unsettled and quotations of any reliability were almost impossible to make, and many were showing anxiety for an immediate disposition of their stock and were willing to make concessions in order to accomplish their purpose. At the same time spinners, both in the North and South, were disinclined to do business at lower prices, as it was evident to them that they could not sell their product at a less figure unless they were willing to submit to a loss. A few mills, however, were found to be working on orders that were for many months to come. It was also evident from the reports received that both weaving and knitting mills, in a number of important instances, were short of yarns and would have to come into the market soon, if they expected to continue running.

Last month was a period of waiting and watching for developments. The month closed with cotton yarn sellers and buyers studying conditions and prospects. It is impossible to make any reliable quotations, and we do not attempt to do so, as the spinners and holders of yarns give little satisfactory reports as to values, which seem to depend upon the financial condition of those having the yarn to sell. Prices vary even from two to three cents per pound, in many instances, above quotations.

Spinners are determined to curtail production unless

they can secure prices that will, at least, assure them against loss. They are willing to operate their machinery if they can be assured that it can be done without loss, as it is not profitable to allow the mills to remain idle, aside from the disorganizing effect upon the force of their employees.

A joint session of the Southern Hard Yarn Spinners' Association, the Southern Soft Yarn Spinners' Association and the North Carolina Cotton Manufacturers' Association was held in Charlotte, N. C., last month, and decided on further curtailment.

About 30 hard yarn mills were represented, aggregating about 400,000 spindles, and about 30 soft yarn mills, aggregating about 280,000 spindles. The hard yarn spinners agreed to shut down the whole month of February or half the month of February and half of March, at the option of individual mills.

The soft yarn spinners agreed to curtail 33⅓ per cent. during February and March, and the advisory board were authorized to change this during the interim, if they thought best to do so.

A number of the spinners state that they are going to shut down and do not expect to start up again until they can do business at a profit, and until there is a change in the present conditions.

SOUTHERN TWO-PLY SKEINS.

4s to 8s	17 @18	30s	21 @21½
10s to 12s	18 @..	36s	26 @30
14s	18 @..	40s	26 @30
16s	18½@..	50s	43 @..
20s	19 @..	60s	50 @..
24s	19½@..	3-ply 8s upholstery	18 @..
26s	21 @..	4-ply 9s upholstery	18 @..

SOUTHERN SINGLE SKEINS.

4s to 8s	17 @17½	22s	19 @..
10s to 12s	17 @17½	26s	20 @..
14s to 16s	17½@18½	30s	21 @..
20s	19 @..		

SOUTHERN SINGLE CHAIN WARPS.

8s to 10s	17 @17½	22s	19 @19½
12s	17½@..	26s	21 @..
14s	18 @..	30s	21 @..
16s	18½@..	40s	28 @..
20s	19 @..		

SOUTHERN TWO-PLY CHAIN WARPS, ETC.

8s to 10s 2 ply	18 @18½	26s 2-ply	21 @
12s to 14s 2-ply	18½@19	30s 2-ply	21 @22
16s 2-ply	19 @..	40s 2-ply	30 @..
20s 2-ply	19½@..	50s 2-ply	44 @..
24s 2-ply	20 @20½		

SOUTHERN FRAME PEELER CONES.

8s	17⅜@18	20s	21 @..
10s	18 @18¼	22s	21½@..
11s	18¼@18½	24s	22 @..
12s	18½@18⅝	26s	23 @..
14s	19 @..	30s	23¾@23
16s	19½@..	40s	23½@..
18s	20 @..		

THE KNIT GOODS MARKET.

Our last month's report was made in the midst of the holiday season, when the trade was in a state of readiness for the opening of the current season, especially for the fall months. Inquiries were being made at that time from various sections of the country for prices on new styles, but things were in a rather indefinite state because of the uncertainty of prospects. Nothing was looked for until the end of January, in full realization that the New Year was to open with a smaller stock of fall and winter goods than ever before being carried over from one year to another.

The year has opened with considerable encouragement, especially in the demands, that have exceeded expectations, more especiallly among jobbers. We have several reports showing that selling agents have been in receipt during the past month of a number of good orders for late spring and early summer deliveries, and that many orders which had been cancelled have been renewed, and in many instances buyers have found that deliveries could not be made with the class of goods that they had already cancelled and desired to have reinstated.

There is a strong disposition, however, among buyers to act conservatively in placing their orders, and wait till the market situation becomes more settled and more definite as to the character of the consumptive demand.

The only thing that can be said in regard to the market, as applicable to both the underwear and hosiery trade, is that the demand is better than it was in October and November, which, however, is not saying a great deal. Gauzes are proving to be desirable goods for spring and summer deliveries. This applies to both the domestic and foreign goods.

The members of the National Association of Hosiery Manufacturers made their position in regard to cancellation of orders most emphatically known at a meeting in Philadelphia last month, when they unanimously voted to fight to the bitter end the disposition of jobbers who insist upon cancelling orders because of the temporary market stringency. It was declared that no cancellation of orders will be accepted unless the credit of the jobber is involved.

The Knit Goods Manufacturers' Association, of which W. H. Morton is secretary, plans to branch out and seek as members all manufacturers of ribbed and fleece-lined goods, balbriggans, woolen goods and knit goods specialties, and that the enlarged organization will work to uphold the knit goods market, regulate trade and selling conditions and look after matters relating to help. The fleece-lined and ribbed makers and those of balbriggans are well represented in the Association, but it is said there are some woolen makers in Cohoes and Troy who do not look upon the new organization with particular favor and who have thus far declined to take an active interest. Woolen manufacturers in the Cohoes section, it is reported, blame the cotton manufacturers for the breaking of the organization which once existed there, and the woolen men now desire to act independent.

SOUTHERN COTTON MILL STOCKS.

Quotations by F. C. Abbott & Co.,
Charlotte, N. C.

	Bid.	Asked.		Bid.	Asked.
Aiken Mfg. Co.	--	91	Exposition	--	--
American Spinning, pfd.	100	--	Fairfield	80	84½
Arkwright Mills	112	--	Florence, N. C.	--	136
Arlington	165	--	Gaffney Mfg. Co.	84	93
Avon	--	--	Gaston	110	--
Avondale	--	--	Gainesville	50	57
Augusta, Ga.	73	77	Gibson	100	--
Bonnie	--	125	Graniteville, S. C.	160	165
Bloomfield	100	--	Gray Mfg. Co.	125	--
Brandon Cotton Mills	125	135	Grendel	--	119
Brookside	--	151	Greenwood	97	--
Capitol City, pref	--	96	Highland Park	165	--
Chadwick, N. C., pref.	100	101	Hartsville, pref	100	--
Chadwick, N. C., com.	130	--	Hartsville	120	--
Clara	130	--	Inman Mills, S. C., pf.	97	--
Clover	150	--	Kesler	135	--
Clinton	150	--	Jno. P. King Mfg. Co.	--	101
Clifton, pref	100	--	Lanaster, com	115	--
Cliffside	--	160	Lanett	110	111
Chiquola Cot. Mills	120	125	Langley Mfg. Co.	--	98
Cherokee Mfg. Co.	150	--	Linden, N. C.	--	125
Converse	112	117	Limestone	140	151
Dallas Mfg. Co., Ala.	--	100	Loray, pref., 1901	103	--
Dover Yarn Mills, N. C.	100	--	Lowell	190	--
Dillon	85	100	Mooresville, N. C.	--	136
Efird, N. C.	130	--	Lumberton	--	201
Elmira, pfd	100	101	Mills Mfg. Co., pref.	105	--
Eagle & Phoenix	132	--	Modena Mills	130	--
Easley	130	155	Mollohon	110	--
Edenton, N. C.	140	--	Monarch, S. C.	107	108½

	Bid.	Asked.
Newberry -	120	--
Nakomis, N. C.	150	156
Olympia, 1st	70	71
Ozark -	--	155
Patterson -	130	--
Piedmont Mfg. Co.	172	--
Pelzer -	169	--
Pell City, com	--	95
Pell City, pref	100	--
Saxon -	124	--
Sibley, Ga.	61	65
Social Circle	103	110
Spartan Mills	146	--
Springstein -	90	--
Statesville Cot. Mills	102	--
Trenton, N. C.	160	--
Tryon, N. C.	121	142
Tuscarora -	115	--
Tucapau, S. C.	198½	210
Toxaway -	94	--
Union Buffalo, 1st pfd.	72	--
Union Buffalo, 2nd pref.	24	28
Union Buffalo, 1st pfd.	--	--
Victor Mills, S. C.	130	--
Warren Mfg. Co.	92	95½
Washington Mills	--	26
Washington Mills, pfd.	--	109
Watts -	118	121
Ware Shoals	--	94
Whitney -	--	125
Wiscassett -	131	136
Woodside -	105	--
Woodruff -	130	--
Williamston -	109	--

NEW ENGLAND MILL STOCKS.

	Asked.	Sales.
American Linen Co.	104	--
Cornell Mills	--	150
Flint Mills	110	107½
Laurel Lake Mills	127½	125
Mechanics' Mills	101½	--
Weetamoe Mills	95	86
Nonquitt Spinning Co.	100	--
Pierce Mfg. Co.	--	304
Soule Mill	130	--
Amory -	--	176½
Amoskeag Mfg. Co.	--	238
Arlington Mills	--	135
Appleton Co.	--	130¼
Boston Mfg. Co. (new)	--	46½
Boston Duck Co.	--	1275
Boott Cotton Mills	--	25¼
Cabot Cotton Mills	--	70
Cocheco (N. H.)	--	205
Chicopee Mfg. Co.	--	100⅝
Continental Mills	--	62
Dwight (Mass.)	--	1177½
Edwards -	--	116
Essex Co.	--	135
Everett (Mass.)	--	132½
Naumkeag Steam Cotton	--	90
New Eng. Cot. Yarn, pf.	--	87
Nashua -	--	700
Osborn Mills	--	100
Pacific (Mass.)	--	2700
Pepperell (Me.)	--	285
Pemberton -	--	95
Tremont & Suffolk	--	87¼

The Chemnitz stocking weavers' guild had in 1755 members from 45 different villages. The wooden frames, as originally devised in the sixteenth century, were in use until fifty years ago. Since then the modern hosiery machinery, with complicated rotary movements, the round frames, the ribbing machines, etc., have appeared and displaced the more primitive forms. The manufacture has been largely centralized in factories and home production is steadily disappearing.

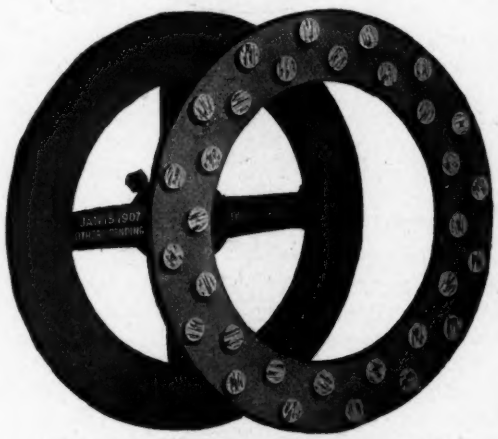
About 6,000 people are employed in the lace factories of Nottingham, Eng., and immediate vicinity; in the bleaching and finishing processes, distinct from the factory work, probably 20,000 more are employed—the number being a variable quantity, dependent upon the state of the trade.

There has been developed on the Sea Islands a well-defined and uniform system of selection in cotton culture. It is based on the correct idea—that of discovering the best individual plant and preserving its offspring.

NEW MACHINERY AND TRADE NOTES

CORK INSERTS.

A great amount of space has been devoted to the question of friction as applied to bearings and their lubrication and very little difficulty is today experienced by engineers in obtaining satisfactory results in the designing and manufacturing of these parts. The opposite of this proposition arises in the question of friction clutch construction where it is desired to absorb power with the least wear and yet allow the necessary amount of flexibility whether used in driving line shafting, looms or other types of machinery.



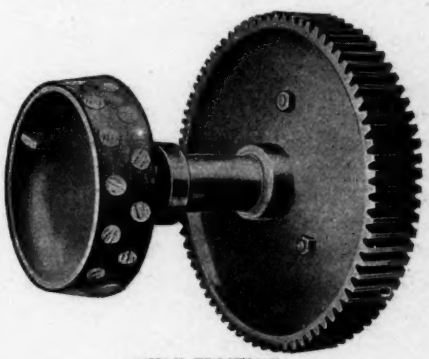
"READY TO USE" CORK INSERT FIBER RING.

In endeavoring to find a suitable medium having a high co-efficient of friction and the necessary durability, various substances and combinations have been tried, but none, apparently, has been found to fill the requirements as well as cork used as an insert. The co-efficient (36) of friction cork is much higher than any other material which possesses the combined qualities of durability, resiliency, non-absorption, and its indifference to excessive heating.

Exhaustive tests made on several types of frictions under the supervision of Prof. Ira N. Hollis at Harvard University, and loom friction pulleys made at the Worcester Polytechnic Institute by Prof. C. M. Allen, bear out these assertions.

The principle clutch troubles of the present time are excessive slipping with consequent loss of power, and burning or abrasion of the frictional surfaces, or a fierce seizing when engaging, resulting in serious strain on the mechanism.

It has been found that by using cork in certain proportions inserted in sockets in one member of the clutch, an accelerating engagement is obtained with greatly increased



MULE FRICTION

ultimate holding power, and one not materially affected by oil, water, dust, moisture, etc.

In loom practice frictions have been fitted with leather facings, a more or less unsuitable material owing to its tendency to burn if allowed to slip, its affinity for oil, water or moisture, and the necessity of cleaning, adjusting, or refacing clutches in which it is used as a facing, and, while this material was the best obtainable for this work prior to the adoption of cork inserts, the results obtained from its use are acknowledged to be far inferior to the use of the latter as a frictional surface.

While cork inserts are not yet used to any great extent in the South, their use is rapidly growing in the North, and it is to be hoped a similar growth will soon be seen throughout the South, for, when the American Woolen Co., after six years' experience with cork insert frictions applies them to the one thousand looms in its new Wood Worsted Company Mill, and is constantly ordering cork insert frictions for its other mills, it is evident that these inserts have merit which should be carefully inquired into by the large manufacturers of the South.

That the use of cork insert frictions is not limited to the friction pulleys on woolen looms is shown by the fact that the Amoskeag Manufacturing Company recently specified cork insert frictions on an order for about one thousand gingham looms, and is rapidly equipping its looms throughout its mills with the so-called "ready-to-use" rings, carrying these instock and replacing the leather facings with the same as fast as practicable.

The Amoskeag Manufacturing Company not only uses cork insert loom frictions as above stated, but is rapidly equipping all its Worrall line shafting clutches with cork inserts, and also similarly equipping all its dynamo and motor pulleys.

Other large mills throughout New England are in the same manner utilizing this invention, the worth of which has been demonstrated by the use of cork inserts in hundreds of thousands of street railway brake shoes, in twenty thousand automobile clutches, and in many other types of frictional devices.

Cork insert pulleys transmit from 50 to 100 per cent. more power than the old plain cast iron pulley; and cast iron cork insert pulleys, fiber faced cork insert pulleys, and wood, cork insert pulleys are now manufactured and sold, and are giving extremely satisfactory results.

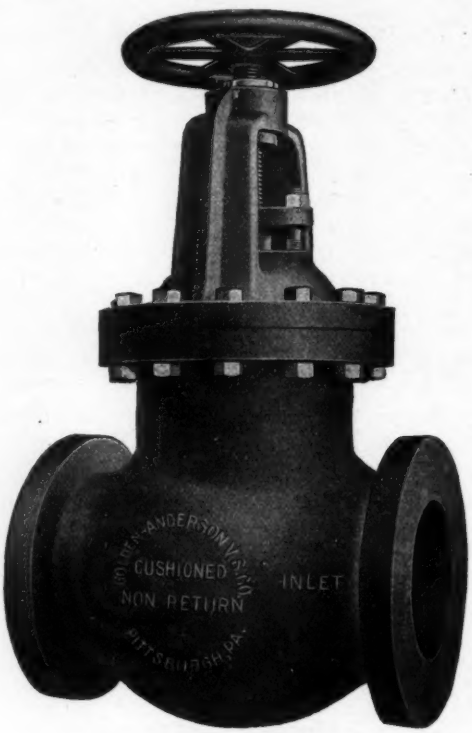
ANDERSON CUSHIONED NON-RETURN VALVES.

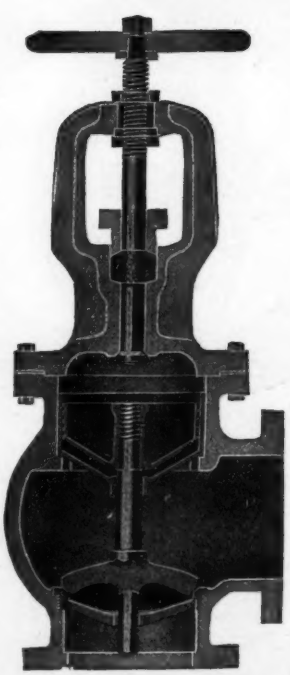
THE LIFE AND PROPERTY INSURANCE VALVES.

These valves supply a very vital part of the general piping system of power stations regardless of the size of the plant or pressure, and as they are made in the angle or straightway pattern, they can be used on vertical or horizontal piping. They are designed and made to meet the demands of steam and mechanical engineers for a high-grade automatic valve, adapted to the highest steam pressure, and especially a valve that will not chatter, hammer or stick, and will be positive in case of accident. These valves are heavily made, and owing to their correct inside mechanical construction, they are absolutely guaranteed. When placed between the boiler and header they will equalize the pressure between the different units of a battery of boilers, as they remain closed as long as the boiler pressure is lower than that of the header. When the boiler pressure equals that of the header pressure, they will open and remain in that position without chattering or hammering. They will automatically cut off a boiler in case of accident to a boiler, such as the bursting or collapsing of a tube, and will also act as a safety stop to prevent steam from being turned into a cold boiler.

Referring to the sectional cut, interest centers in the dash-pot arrangement for cushioning these valves, which is so essential in order to avoid chattering, hammering and sticking.

The inside bronze dash-pot is firmly attached to the valve spindle, while the outside bronze dash-pot is loose on the spindle, and free to move in the body; in a word, "a Corliss dash-pot" occupying the full area of the body, thus absolutely insuring the perfect cushioning feature and the perfect alignment of the valve with the seat at all times regardless





of position. When the steam pressure raises the valve, there instantly exists the resulting space between the inner and outer dash-pots. The latter being loose on the spindle allows the steam to pass between the dash-pots, also on account of the circulation of steam around the outside dash-pot through the several vertical grooves cut in the upper portion of the body, condensation is eliminated.

THE GANDY BELTING COMPANY WINS ANOTHER VICTORY.

The United States Court for the Northern District of Illinois, Eastern Division, has just issued a decree in their favor, in an action brought by them against the Weller Manufacturing Company, of Chicago, perpetually restraining them from selling, advertising, offering or announcing for sale, or supply stitched cotton belting painted or dyed red in imitation of the "red stitched cotton" belting manufactured by this Company, accompanied by the word "Gandy" affixed or applied thereto, or used in connection with the sale thereof.

It also permanently restrains them from in any way using the trade-mark of the Gandy Belting Co., cut of which is shown herewith.

The Gandy Belting Co. announces they were forced to bring this action in order to protect the consumer, and to break up the fraudulent practice that has grown so prevalent in recent years among certain manufacturers and dealers of selling all kinds of cheap imitation stitched cotton duck belting, claiming it to be the genuine "Gandy" Belting. Consumers are therefore warned to be particular, and see that the belting they buy bears the words "Genuine Gandy" stamped at every ten feet.

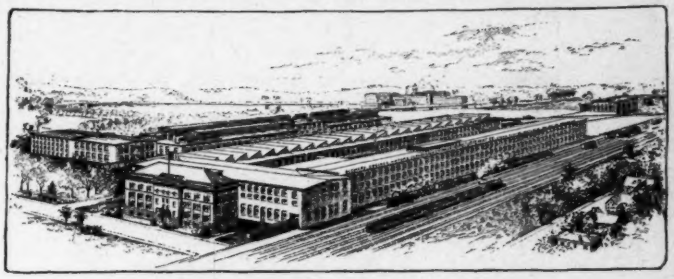
It is the intention of the Gandy Belting Co. to prosecute every case of infringement brought to their attention in order to put a stop to the tresspass upon their good will.

THE MANUFACTURER'S SHEET ANCHOR.

So long as the normal output was required to supply the home market, the B. F. Sturtevant Company, in common with many other manufacturers, followed the path of least resistance, cultivating the trade in this country but not giving the export business the attention it deserved. The European trade of this company has been for many years and still is handled through the Sturtevant Engineering Company of London under the able direction of George A. Mower, whose experience and knowledge of the blower business is extensive.

In Hyde Park, Mass., the B. F. Sturtevant Company has a magnificent new plant fully equipped with the latest and best machinery and apparatus, and of such size and arrangement as to comfortably and economically employ 2,500 hands. In fact, the works are the largest in the world devoted to the manufacture of the products of this company. As originally planned, provision was made for still further extension, so that the plant could easily be made of a size that would supply the entire world with its products while maintaining the present high standard of excellence and promptness in shipment. With these facilities it is easy to see that the home market alone is no more than sufficient, and when this market slumps trade must be carried into other fields, otherwise the works must be operated at less than economical capacity. These facts show the necessity of a balance wheel or sheet anchor.

Looking the situation squarely in the face it was admitted that the export business was not satisfactory, the volume being much less than to be expected for a company



B. F. STURTEVANT COMPANY'S WORKS.

producing goods which are standard the world over in the particular lines. Although perhaps the principal reason for the small volume of export business was the strong home market, yet other reasons presented themselves when the matter was investigated.

The manufacturer in this country is at a considerable distance from European markets, a condition that causes

B. F. STURTEVANT COMPANY'S AGENCIES IN EUROPE.

ignorance regarding the class of goods required, the customs of foreign countries, and such matters as tariffs, insurances, dock dues, etc., matters so necessary to the smooth, economical handling of export business. Doubtless the average manufacturer is similarly situated. After realizing the desirability of finding a market in foreign countries for its products, the B. F. Sturtevant Company set about overcoming the prevailing difficulties. The first step was a better acquaintance with the conditions of foreign sale and export. To secure this information and acquaintance by sending a man to study the problem would cause a prohibitive delay, due to the fact that many years would be required for the representative to become sufficiently familiar with European trade to talk authoritively on such matters. The alternative was to reverse the plan and get assistance from a man

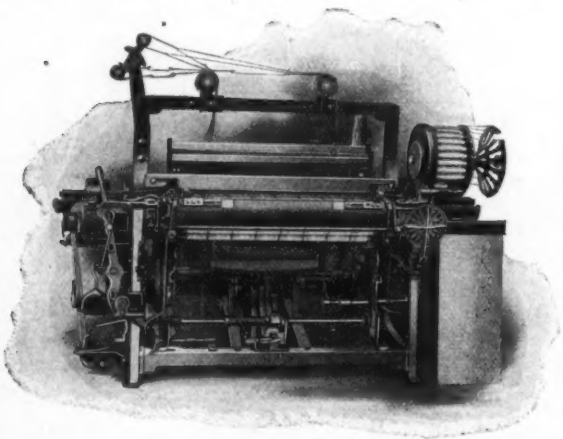
already acquainted with the export trade and at the same time having a thorough knowledge of the products of the Sturtevant Company.

To develop this export business this company secured the assistance of an English engineer, R. Hancock, who has had extensive experience in handling similar products abroad, and whose knowledge extends over the trade situation as well as the industrial conditions throughout Europe. Just before associating himself with the Sturtevant Company, Mr. Hancock traveled throughout all European countries ascertaining the requirements of the trade and establishing further representatives on the continent. This information, together with its splendid manufacturing facilities, enables the company to send abroad standard products that meet the special demands of the various European nations, and successfully compete with apparatus manufactured abroad

At the present time the Sturtevant Company has direct representation in London, Glasgow, Paris, Berlin, Vienna, Brussells, Turin, Stockholm, St. Petersburg, Moscow, Odessa, Kief, Warso, Karkoff and Herodfordshire. Further arrangements are now being made for representation in Japan, China, and many of the British Colonies.

DRAPER'S E MODEL LOOM.

After many experiments with various models for varied uses the Draper Co., Hopedale, Mass., still recommend the standard E model for general use. The best points of other models have been gradually incorporated in this design. The loom illustrated in the cut is equipped with five harness, cotton harness, feeler, double fork and loom



seat. Note the three part square corner arch, the new iron filling box top and other details. The company has heavier looms for heavy weaves and lighter looms for light weaves, but it finds the majority of its customers prefer this model to a lighter style for any light goods and many find it sufficiently heavy for any general weaving. The company's new catalogue now in the hands of the binder will show its other models.

WISCONSIN TEXTILE COMPANY, Two Rivers, Wis. This company has sent out to the trade a small memento, representing a hand made of wood, such as is used by the company for its various products as hosiery boards, forms, etc., used by the knitter, upon which appears a monthly calendar for the year 1908. In this way the company extends to its friends and patrons the "glad hand," and in the words of Rip Van Winkle, "may you live long and prosper." This company has increased its capacity nearly ten fold, which bespeaks for it most fully the success with which it has met.

CASSELLA COLOR COMPANY, New York. This company has issued two color cards, one devoted to its Immedial Olive G G, and the other to Diamine Fast Scarlet G G, 4BN, 6BS, and 8BN. Both of these are new products. The Immedial Olive G G is prominent for its fastness to washing, and may be used in combination with any of the other Immedial colors of this company, and is very well suited for machine dyeing, and for the dyeing of effect threads fast to cross dyeing in acid bath. The Diamine Fast Scarlet brand possesses the advantage of yielding bright shades and of exhausting well, and is fast to perspiration and acids on cotton yarns, cotton cloth and loose material, and is suitable for machine dyeing.

REVERE RUBBER COMPANY, Boston, Mass. We are in receipt of an illustrated catalogue of this company, showing its manufactures of high-grade belting, hose, blankets, rubber-covered rolls, valves, springs, and other rubber goods for mechanical use. In the manufacture of these goods the company uses none but the finest grade of rubber, the latest improvements and special machinery of its own design, and of more importance than all this it extends to its customers an experience that dates back to the infancy of the rubber industry.

ROSENTWIST & GORNER, 26 India Square, Boston, Mass. This is a new partnership for the purpose of carrying on the general business of dyestuffs and chemicals.

BERLIN ANILINE WORKS, New York City. This company has issued a color card showing its Naphtogene Blue B. This is a new brand, which when diazotised on the fiber and developed, yields indigo blue shades of fastness for washing and light, and is well adapted for all branches of fast dyeing on cotton yarn in hanks, raw cotton, cops, bobbins, piece-goods, etc.

FARBENFABRIKEN OF ELBERFELD COMPANY, NEW YORK CITY. This company has sent out a color card showing a new blue Katigen dyestuff designated as Katigen Indigo 2 R L extra, considerably redder and brighter in tone than the other Katigen Indigo brands. This new color is recommended for the dyeing of loose cotton and yarns for fancy woven goods or articles which have to be fast in washing, etc., also for cops and cheeses in machines, as well as for cloths for workmen's suitings, etc.

STAFFORD & HOLT, LITTLE FALLS, N. Y. This company has issued a catalogue of knitting machinery for 1908, illustrated with various machines for knitting ribbed shirts and drawers; bathing suits and jerseys, etc. This company is well known for its pineapple stitch knitting machines; toque machines; wrapping machines; flat stitch and single nop-pen toque machines; ribbed toque machines; sleeve machines; cord and facing machines; metallic napping machines, etc.

AMERICAN MOISTENING COMPANY, Boston, Mass. The humidifiers of this company have been adopted by the Putnam Manufacturing Company, Putnam, Conn. Additional installations of this company's humidifiers have been made by Stehli & Co., High Point, Ga., and the Hill Mfg. Co., at Lewiston, Me. Repeat orders have been placed by the Clifton Mfg. Co., Clifton, S. C.; Barnard Mfg. Co., Fall River, Mass.; and the Forestdale Mfg. Co., Forestdale, R. I.

UNIVERSAL WINDING CO., Boston. The new Universal filling bobbin, now being introduced by this company, is said to increase the production of weavers from 40 to 60 per cent., in that they contain two or three times more yarn than ordinary bobbins and thereby add to the efficiency of the loom. The new No. 90 Universal bobbin winder, just placed on the market by the same company, is the result of many years of experiment and is now presented as a practical and perfected mechanism.

POWER SPECIALTY CO., 111 Broadway, New York, manufacturers of the Foster patent "steam superheater," report a very gratifying increase in the volume of business secured for 1907 as compared with any previous year. The past ninety days has witnessed some falling off in orders, but renewed inquiries within the past few weeks, and resumption of negotiations temporarily deferred by reason of recent financial conditions, indicate that a large number of contracts will soon be closed. Among recent orders for these superheaters for installation in practically all types of boilers, the following are mentioned: Bernheimer & Schwartz Brewing Company, 2,000 H. P. in Heine boilers; Schlitz Brewing Company, 2,000 H. P. in Edge Moor boilers; Clark Thread Co., Newark, N. J., 2,500 H. P. in Stirling boilers; Megargee Paper Company, 750 H. P. in Continental boilers; Wisconsin Steel Company, 7,000 H. P. in Stirling boilers; and Solvay Process Co., Detroit, Mich., 1,800 H. P. in B. & W. boilers.

THE ROBERT SCHAELLIBAUM CO., Providence, R. I., has recently made complete installation of its patent grid for openers and lappers in the following Southern mills: Arkwright Mills, Spartanburg, S. C.; Aetna Mills, Union, S. C.; Globe Mills, Gaffney, S. C.; Southern Manufacturing Co., Athens, Ga.; Ide Cotton Mills, Jacksonville, Opelika Cotton Mills, Opelika, and Talladega Cotton Factory, Talladega, Alabama.

CASSELLA COLOR COMPANY, New York, has issued two color cards, one relating to their Immedial Brilliant Green G Extra, and the other to Diamine Fast Brown G and R. The first supplements the group of green immedial colors, and combines with their other excellent properties the advantage of yielding a particularly bright yellowish green shade suitable for the cotton dyeing industry. Its properties are fastness to washing, light, hot pressing, acids and stoving. The second shows two new brands of diamine colors notable for their bright shades, combined with excellent fastness to washing and light, and good fastness to chloring. It levels exceedingly well, and, therefore, is adapted for direct dyeing of bright shades of brown, as well as for mode shades, suitable for the cotton dyeing industry.

F. K. RHINES has accepted the position of assistant to the treasurer and general manager of the General Fireproofing Co., Youngstown, Ohio, and assumed his new duties the first of this year. Mr. Rhines was formerly engineer for the East Iron & Machine Co., Lima, Ohio, and more recently chief engineer and general manager of the Dixon Engineering & Construction Co., Toledo, Ohio.

R. O. JONES has assumed the duties of chief engineer of the Dayton Hydraulic Machinery Co., Dayton, Ohio. Mr. Jones is an engineer of wide experience in the manufacture and construction of pumps of all kinds, having been for the past nine years associated with the Jeansville Iron Works of Hazelton, Pa., and for several years past was their chief engineer.

We are informed that Henry H. Cypher has severed his connection with the Eureka Fire Hose Co., of New York City.

THE LOWELL TEXTILE SCHOOL, Lowell, Mass. A special bulletin of this school has been issued, devoted to the department of cotton manufacturing and the instructions pertaining thereto for 1907-08. Instruction is given on the cotton fiber, opening and picking, carding, drawing, roving processes, ring spinning and twisting, combing, mule spinning, and mill organization. An excellent course in knitting is provided, with machiners for practical demonstration. Instruction is given in textile design and cloth analysis; in chemistry and dyeing, as applicable to cotton manufacturing; in weaving and warp preparation and the technical work upon the loom; in mechanics, mechanical drawing, steam, electricity and hydraulics. This bulletin furnishes information regarding the qualifications necessary to the candidates for admission.

N. L. WILLETT SEED COMPANY, Augusta, Ga. This company has issued its 1908 seed catalogue, listing more varieties of cotton than heretofore by any one house. Each variety has a full description of its valuable points. This catalogue can be had free upon writing for it. This company has recently shipped three carloads of seed to Liverpool, one to East Africa, one to Mexico, one to Mississippi, two to Louisiana, and one to Alabama, and yet the season has not fairly commenced.

Nottingham, Eng., is preeminent in the production of machine lace, for several reasons—first, the invention of the stocking frame in this county; second, the town was always noted for its mechanical skill; third, the inventors and improvers of lace machinery were Nottingham men; fourth, the damp climate. Cotton-cloth making was first started in Nottingham, but was moved to Lancashire because the climate was not damp enough here, though right for lace making.

In Calais there is a technical school, under the supervision of Abbe Piedfort, which has for its object the training of young boys in the technics of the lace industry. This school embraces sketching designs, designing (i. e., reducing the sketch to the mechanism of the loom), lace making, "metteur en œuvre," and "regleur."

COTTON MILLS OF SOUTH CAROLINA, by August Kohn, Columbia, S. C. This is the title of a book recently from the press, consisting of letters written by the author to the *News and Courier*, Charleston, S. C. It shows careful and conscientious observations of the cotton mill industry of this State, and is a valuable record of existing conditions affecting the mills and those employed by them, showing how they are prospering, and especially what the operatives are doing for themselves, how they are paid, how they live, what they work for, and what their ambitions in life really are. The work devotes itself to such subjects as thrift among the operatives; health of the help; spindles; statistics; taxation; employment of children; welfare work; kind of goods made, etc., etc.

COTTON FACTS, by Alfred B. Shepperson. The 1907 edition of this well-known publication, which has annually appeared since 1876, is full of valuable statistics that every cotton man has occasion to refer to quite frequently. This edition contains, in addition to tabulated statistics, the following matter: An article by Geo. Otis Draper, of Hopedale, Mass., on the "Labor Problem of the American Cotton Mills;" an authentic account of the "Future Delivery" business in New York, Liverpool and New Orleans since its inception; a table showing at a glance the salient features of production, consumption, etc., for the past ten seasons; weekly prices of "Future Deliveries" in Liverpool for the last two seasons; the various reports of "ginning" issued by Census Office since 1903; a map showing the exact territory infested by the Mexican cotton-boll weevil each season since 1904; and a full account of the persons who formulated each estimate of the Department of Agriculture respecting cotton since December, 1906.

LABOR SAVING LOOMS. This is the title of a third edition of this treatise on plain weaving, and recent improvements in that line, with reference to the Northrop looms, manufactured by the Draper Company, Hopedale, Mass., who will supply copies, on request, to men occupying responsible positions, directly connected with the weaving departments of the factory.

THE CHILD'S GARDEN. The Eagle and Phenix Mills, Columbus, Ga., have isued a little booklet, with many illustrations, showing what this corporation is trying to do for the children and girls of families connected with its establishment. To the limit of its ability it has tried to get the best buildings, equipment and teachers that thought and cash can command, and professionals from other places have said that what is being done is unexcelled.

THE MASON MACHINE WORKS, Taunton, Mass., have just issued, in accordance with their usual practice, a magnificent calendar for 1908, containing a large reproduction of a painting by C. M. Russell, and representing the capturing of a grizzly bear. It is an exciting scene, showing three cow-boys on horses approaching the bear from different directions with lassoes.

Seventy American firms have resident agents at Chemnitz—frequently American citizens—purchasing and shipping hosiery, gloves, and other textiles.

MILL NEWS.

Notices of mill projects, additions or improvements are solicited for this department.

ALABAMA.

DADEVILLE.—A power plant is being planned to spin cotton into yarn and knit the yarn into whole and half hose. Hall Brothers are interested.

EUFAULA.—A knitting mill is to be established here in which local capital will be interested, beginning on a small scale and increasing the plant as necessity requires.

MUNFORD.—A 3,000-spindle cotton mill is being erected here and is expected to start early this year.

GEORGIA.

BALL GROUND.—The Ball Ground Cotton Mills will build a plant here to manufacture denims, drills, or eight-ounce duck. They are putting in 10,000 spindles and 300 looms. A. J. Lovelady is president.

GREENWOOD.—The Greenwood Mattress Company will be begun and operated on a capital of $25,000. W. T. Loggins and N. S. Wright and others are interested.

MACON.—The Atlanta Guarantee Hose Company, Atlanta, Ga., is to establish a branch mill at Macon. D. F. Ferris is president of the company.

KENTUCKY.

PADUCAH.—The Wisdom Hosiery Co., that was recently incorporated, has under consideration the doubling of its equipment.

LOUISIANA.

NEW ORLEANS.—The Kohlmann Moss and Cotton Felt Manufacturing Co. has been incorporated with a capital of $16,000. Louis Kohlmann is one of the incorporators.

MAINE.

PORTLAND.—The Holmes Knitting Company has been incorporated with a capital of $20,000, of which nothing has been paid in. Jas. E. Manter is president and Clarence E. Eaton is treasurer, both of Portland.

MINNESOTA.

CROOKSTON.—It is stated that a linen mill is to be established here to be known as the Oxford Linen Mills, to have a capital of $50,000. These mills intend to use about 3,000 tons of flax per year, for which they are willing to pay from $2.00 to $8.00 per ton, the price depending on the quality of the stock. Fifty hands will be employed continually.

MISSOURI.

ST. LOUIS.—The Watson-Glasgow Hosiery Co., of this place, has been incorporated with a capital of $35,000. W. H. Watson is an incorporator.

NORTH CAROLINA.

CEDAR FALLS.—The Cedar Falls Manufacturing Company has been incorporated with a capital of $125,000 to manufacture cotton goods. J. C. McAllister, of Spray, is interested.

DREXEL.—D. B. Mull is interested in a scheme for the establishment of a hosiery mill in this place.

FAYETTEVILLE.—J. T. Ewing, Dillon, N. C., will soon erect a large knitting mill here.

KINSTON.—The Caswell Cotton Mills that were incorporated last October with a capital of $200,000 are to erect a building 80x200 feet, two stories high, and install 5,700 spindles for manufacturing Nos. 20 to 24 soft hosiery yarns. The equipment will probably be increased this year to 15,000 spindles. J. E. Hood has been elected president.

MARION.—The James Manufacturing Company has been

incorporated with a capital of $100,000. J. L. McKay, of King's Mountain, is one of the incorporators.

NEWTON.—Plans have been completed and contracts are soon to be awarded for a new power plant for mills, to be of modern construction and erected and completed as soon as possible. H. F. Smith, manager of Ridgeview Cotton Mills, can furnish information.

MOORESVILLE.—The Dixie Cotton Mills have been started. The main building will be two stories, 100x100 feet, the equipment will consist of 5,000 spinning and 2,500 twisting spindles, producing 24's and 30's yarns. The building will cost about $300,000, and the mahinery nearly $50,000.

WAKE FOREST.—The Royall Cotton Mill has just built a three-story addition 80x120 feet, in which it has installed 5,000 spindles and 186 looms, furnished by the Lowell Machine Shop and the Draper Company.

NEW JERSEY.

NEWARK.—J. S. Brockie Company has been incorporated with a capital of $10,000 for the manufacturing of tents and awnings. Henry A. Brockie is one of the incorporators.

NEW YORK.

UTICA.—The Artistic Knit Goods Company has been incorporated with a capital of $50,000. Wm. E. Lewis, of Utica, can furnish information.

UTICA.—The Illma Underwear Company recently founded with $18,000 capital, will soon begin operations.

OKLAHOMA.

GUTHRIE.—The Woodbury Manufacturing Company has been incorporated with a capital of $50,000. E. V. Remington, of Oklahoma City, can furnish information. The concern contemplates the erection of a cotton mill but the location is not settled, whether it is to be at Oklahoma City or at Woodbury, Ga.

PENNSYLVANIA.

MIFFLINTOWN.—A new dyeing and finishing works is to be located here by Frederick Schimmel, of Philadelphia, and others. It is expected that the plant will be in operation some time in March. The Novelty Print Works, now in Philadelphia, will be incorporated with this new concern.

PHILADELPHIA.—F. Schimmel has established the Novelty Print Works, and will dye and finish hosiery, window shades, portiers, etc.

PHILADELPHIA.—The Standard Hosiery Company has erected a four-story building to be of brick and re-inforced concrete, 50x150 feet. The cost will be about $50,000.

SOUTH CAROLINA.

CHARLESTON.—The Carolina Waste Mills have been incorporated by parties more or less connected with the Royal Bag & Yarn Company, of this city. The company proposes to conduct the usual business of a waste mill and will use much of the cotton waste made by the mills in this State. George A. Waggener can furnish any information.

GREENVILLE.—The McGee Manufacturing Company has under consideration the plan of increasing its capital from $100,000 to $175,000.

KINSTON.—The Kinston Cotton Mills have built an addition 46x80 feet, and 5,000 spindles have been installed.

LANDO.—Manetta Mills Company is laying foundations for an addition to be 100x125 feet, three stories, to contain carding, spinning and weaving machinery.

LEXINGTON.—A modern knitting mill is about to be erected here in which Louis W. Reed is interested

ROCKHILL.—A new knitting mill is planned for this place to be equipped with 50 machines. L. W. Rodd, of Lexington, is interested.

SPARTANBURG.—The Crescent Manufacturing Company will be equipped with a complete spinning plant with electric power, and several cottages will be built, but no additions will be made to the mill building.

TENNESSEE.

CHATTANOOGA.—The Wachovia Mills, of this place, propose to spend $2,000,000 on previously announced additions and new equipment. W. J. Young is president.

MADISONVILLE.—A new knit goods plant is proposed for this place, in which Thos. Upton is the principal one interested in promotion of the movement.

MEMPHIS.—Farmers' Educational and Co-Operative Union held a meeting at this place not long since and decided to arrange for erection of two plants for the manufacture of cotton bagging and sacks.

TEXAS.

FORT WORTH.—D. J. Neill, president of the Farmers' Union, is interested in the organization of a company with a capital of $500,000 for building a cotton mill.

WISCONSIN.

FAIRCHILD.—A knitting factory is soon to be started here in which a Mr. Arquett is interested.

LA CROSSE.—The Star Knitting Company has been incorporated with a capital of $25,000. Robert Calvert is one of the incorporators.

MILWAUKEE.—The Lakeside Dye Works has been incorporated with a capital of $10,000. Jas. Jenson is one of the incorporators.

JOHN THOMAS MORELAND.

A SELF-MADE MAN.

Notwithstanding that this is an age of steam and electricity, of advanced technical training and modern methods in all branches of manufacturing industries, the world today is quick to recognize and respect the sturdy, self-made man—that type of man whose intellectual equipment is good common sense and sound judgment, who is compelled to learn his trade or profession by long years of exacting toil as an apprentice before the days of technical training schools, whose only school is that of *experience*,—in learning to do by doing. The subject of this sketch is that type of man.

Nearly fifty years ago, in Spartanburg county, South Carolina, the cradle of cotton manufacturing in the South, John Thomas Moreland was born. Being one of a large family of children, it was necessary at an early age to put him to work in a cotton mill, where he began the usual career of sweeping, doffing, spinning, etc. From year to year he worked, observed, studied and learned, until every detail of the operation of machinery and manufacturing cotton became a matter of routine with him.

For a brief term each summer he was sent to school, but his real education did not begin until after his marriage at about 20 years of age. His wife, being well educated and having had experience in teaching, at once began to direct his mind into channels looking to a practical education. Under her leadership and inspiration he diligently applied himself to reading and general study until the deficiency in his scholarship had been overcome.

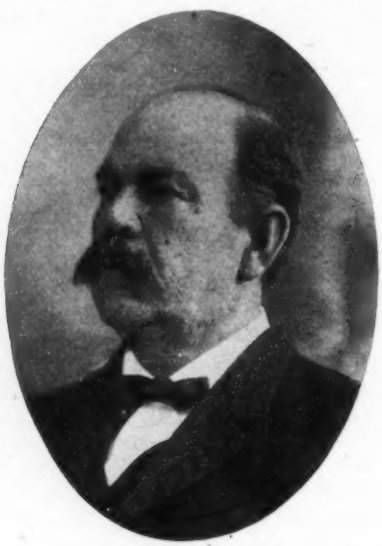
Not being content to spend his life as a mill hand, Mr. Moreland, by reason of his industry and fitness, was made section hand. Showing his ability in this capacity, he was soon advanced to take charge of a room. In this capacity he gained his most valuable experience, especially in the management of help and in getting the best and greatest production.

Looking still higher, he was advanced to the responsible

position of mill superintendent, his first place being with the Henrietta, N. C., mill. From there he went to Spartanburg to take charge of the Saxon mills, in the same capacity, where his years of faithful service and strict adherence to duty were largely instrumental in making the Saxon mills one of the model cotton manufacturing plants in the South.

Resigning his place with the Saxon mills for a few months of recuperation he accepted the charge of the Aurora mill, Burlington, N. C., where he is at present engaged.

The chief factors in Mr. Moreland's achievement of success are his purity of character, absolute honesty and integrity, enduring energy and undaunted courage. As were his parents before him, he is a consecrated Christian. His convictions are sincere—the kind that manifest themselves in business and on week days as well as on Sunday.



J. T. MORELAND.

While a liberal and charitable man, Mr. Moreland has accumulated several thousand dollars, which is another evidence of his ability and foresight.

Physically, Mr. Moreland has few equals. Weighing about 225 pounds of solid bone and muscle tissue, he is a living contradiction of the sensational statements made by certain magazine writers, asserting that all mill children are condemned to sickness, misery, and early death.

AMONG SUPERINTENDENTS, OVERSEERS AND OTHERS.

We shall be pleased to receive notices of any changes among agents, superintendents, and overseers in textile mills.

W. J. Grant has been made overseer of weaving at the Indian Head Mills of Alabama, Cordova, Ala.

J. A. Adams is now in charge of the carding in Mill No. 2 of the Merrimack Manufacturing Company, Huntsville, Ala.

W. F. Dellinger has accepted the superintendency of the mills of the Athens Manufacturing Co., Athens, Ala.

J. A. Summey is now overseer of carding for the Glenn-Lowry Manufacturing Company, Whitemires, S. C.

I. B. Covington has been elected superintendent of the Mt. Holly Cotton Mills, Mt. Holly, N. C.

G. F. Howard has been made overseer of spinning for the Golden Belt Manufacturing Co., Durham, N. C.

John N. Hasty has taken the position as overseer of weaving in Mill No. 1 of the Pee Dee Manufacturing Company, Rockingham, N. C.

W. P. Hurt has been chosen superintendent of the Elk Cotton Mills, Fayetteville, Tenn.

N. T. Barber has been appointed superintendent of the Conanicut Mills, Fall River, Mass.

George E. Priest is now superintendent of the Bourne Mills, Fall River, Mass. Mr. Priest was assistant superintendent of the Boott Mills, Lowell.

W. A. McVickars now has charge of the weaving for the Mt. Airy Cotton Mills Company, Mt. Airy, N. C.

D. E. C. Clough has been chosen superintendent for the Fidelity Manufacturing Company, Charlotte, N. C.

G. F. Roberts has accepted the superintendency of the Washington Mills Co., Fries, Va.

Frederick H. Knapp is now overseer of knitting for the Oxford Knitting Mills, Barnesville, Ga.

I. J. Dixon has taken the position of overseer of carding and spinning at the Fidelity Manufacturing Company, Charlotte, N. C.

J. A. Barlor has become overseer of weaving, slashing, warping and web drawing for the Cochran Cotton Mill Co., Cochran, Ga.

Grant Estlow has taken the position as general superintendent of the Cedar Falls Manufacturing Company, Cedar Falls, N. C.

W. C. Spencer is overseer of spinning for the Rhode Island Company, Spray, N. C.

E. N. Tart has taken the position as overseer of spinning for the German-American Company, Draper, N. C.

Jacob Shuford has taken charge of twisting for the Fidelity Manufacturing Company, Charlotte, N. C.

George T. Jackson is now overseer of weaving and designing for the Meridian Cotton Mills, Meridian, Miss.

Benjamin F. Chace, formerly superintendent for the E. Jenecks Manufacturing Company, Pawtuckett, R. I., has accepted a similar position at the Samoset Mills, Valley Falls, R. I.

H. J. Forsyth has taken the superintendency of the Wylie Mills, Chester, S. C.

L. A. Thompson, a graduate of the Textile Department of the N. C. A. & M. College, in 1905, has taken the superintendency of the Lakeside Mills, Burlington, N. C.

Charles S. Smart has taken the position as superintendent of the Cooleemee Cotton Mills, Cooleemee, N. C.

W. C. Quick is now overseer of carding in the Marlboro Cotton Mills, No. 4, McColl, S. C.

Henry B. Massey has taken the position of overseer of carding with the Fairfield Cotton Mills, Winnsboro, S. C.

W. M. Preddy is now overseer of weaving in the Leaksville Cotton Mills, Spray, N. C.

T. L. Saunders has been promoted to the superintendency of the Shelby Cotton Mills, Shelby, N. C.

Grover Truslow has been made overseer of mule spinning and carding in the Manetta Mills, Lando, S. C.

James Earnhardt is now overseer of carding in the Rodman-Heath Mills, Waxhaw, N. C.

C. H. Cole has been chosen superintendent of the Aragon Mills, Aragon, Ga.

D. E. West is now superintendent of the Fountain Inn Manufacturing Company, Fountain Inn, S. C.

A. L. Tyner has been made overseer of carding and spinning at the Eastman Cotton Mills, Eastman, Ga.

John Bagwell is now in charge of the cloth room of the Clifton Manufacturing Company, Clifton, S. C.

W. P. Campbell has been chosen superintendent of the LaFayette Cotton Mills, LaFayette, Ga.

J. A. Campbell is now in charge of the carding and spinning at the LaFayette Cotton Mills, LaFayette, Ga.

COTTON is the leading textile paper in the South.